Online Interface for Horticulture Commodity Statistics

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HAL

Horticulture Australia

Online Interface for Horticulture Commodity Statistics

ABARES report to client prepared for Horticulture Australia Limited

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Background

In 2008–09 Horticulture Australia Limited (HAL) commissioned the former Bureau of Rural Sciences (BRS) to deliver a project, 'Establish the Horticulture Statistics Database Online Analysis Capability' as part of a long-term HAL strategy to establish an online information system.

Following the delivery of the online analysis capability, HAL engaged the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) to develop a suite of web services capable of displaying ABS horticultural production data in the form of maps, graphs and tables. This suite of web services were incorporated into a new HAL website created by Liquid Vision. The web services project 'Online Interface for Horticulture Commodity Statistics' was delivered by ABARES in May 2011.

This document is the final report for the 'Online Interface for Horticulture Commodity Statistics' project. It provides a summary of the project and recommendations to assist HAL extend its newly improved information system to provide access to a broader range of data relevant for planning and decision making in the horticulture industry.

Objective

The objective of the 'Online Interface for Horticulture Commodity Statistics' project was to develop web services that provide long-term access to ABS survey data for 81 selected horticultural commodities and incorporate these into a new HAL web interface; the Hortstats website

Outcomes

ABARES has developed time-series graphs and maps of total production, area planted, number of plants, yield per area, yield per plant, production value and number of respondents for 81 selected commodities. The data are sourced from the Australian Bureau of Statistics agricultural surveys. It is the first time that these data have been made available online through a web service delivery framework in an easy-to-use format as graphs and maps on a national, state and regional scale.

Recommendations

Recommendation 1: HAL should develop and endorse a maintenance contract for the continued delivery of data products and web services for the Hortstats website.

Recommendation 2: HAL should further progress its plan to extend data on its newly released website to provide access to a broader range of up-to-date data relevant for planning and decision making in the horticulture industry.

Recommendation 3: HAL should refine its map-based production statistics outputs to clearly identify where horticultural production takes place within each statistical division.

Recommendation 4: HAL should consider further development options to provide additional features and functionality to the Hortstats website to better meet the business requirements of HAL and its stakeholders. This future development work should be informed through market research to identify user needs.

1   Background

FutureFocus is the Australian horticulture industry strategic plan developed for HAL in 2008. FutureFocus is designed to position the horticulture industry to proactively address future challenges and give the industry a strategic path for future growth. FutureFocus is intended to direct the industry's attention to opportunities that will increase profitability, whilst building whole of industry approaches to aid commodity specific plans. One of FutureFocus' aims is to balance a long-term strategy with immediate industry concerns. Another is to deliver tangible outcomes and advice to the industry, including insights into what should be done, when, why and how.

In 2008–09, Horticulture Australia Limited (HAL) commissioned the former Bureau of Rural Sciences (BRS) to deliver a project, 'Establish the Horticulture Statistics Database Online Analysis Capability' as part of a long-term HAL strategy to establish an online information system, as outlined in its FutureFocus industry plan.

Following the delivery of the online analysis capability, HAL engaged the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) to develop a suite of web services capable of displaying ABS horticultural production data in the form of maps, graphs and tables. This suite of web services were to be incorporated into a new HAL website created by Liquid Vision under a separate project. This web services project 'Online Interface for Horticulture Commodity Statistics' was delivered to HAL by ABARES in May 2011.

This document is the final report for the project completed by ABARES. It provides a summary of the project and recommendations to assist HAL extend its newly released information system to provide access to a broader range of data relevant for planning and decision making in the horticulture industry.

2   The Project

Objective

The objective of the 'Online Interface for Horticulture Commodity Statistics' project was to develop web services that provide long-term access to ABS survey data for 81 selected horticultural commodities and incorporate these into a new HAL web interface; the Hortstats website. Liquid Vision was responsible for the design and build of the Hortstats website under a separate project.

Scope

Development of data products and web services for inclusion in a HAL focused web interface including design and functional requirements with the following features:

- access to map-based spatial data
- access to time-series graphs of ABS agricultural survey data, and
- development and inclusion of national, state and regional time-series data derived from ABS agricultural survey data.

Deployment of web services to an external accessible Unix-based server.

Support for the integration of web services into the HAL web interface, in collaboration with Liquid Vision

Development of a proposal for the maintenance and continued delivery of data products and web services to the new web interface from July 2011.

Methodology

Data

The data for the 81 selected horticultural commodities available in the Hortstats website have been sourced from the Australian Bureau of Statistics (ABS) as annual financial year values, reported at statistical division level, from 1983 to 2009. The data sets were concorded by ABARES to a common set of spatial boundaries - the 2005–06 statistical division coverage. There are 66 ABS statistical divisions that cover Australia, ranging from very large areas such as the South Eastern statistical division in Western Australia, to much smaller areas such as the Gold Coast statistical division in Queensland.

As well as the spatial concordance, ABARES converted each variable to common units as follows:

- Production in tonnes
- Area planted to crop in hectares
- Number of plants
- Crop yield per hectare
- Crop yield per plant
- Value of production in dollars, and
- Number of respondents.

Yield was derived as a ratio of the total production in tonnes and total area of horticultural land in hectares.

The ABS data are collected from 'in-scope' farm businesses with an estimated value of agricultural production, or a Business Activity Statement turnover, greater than or equal to $5000. ABS estimates indicate that in 2008–09 there were 171 000 'in-scope' agricultural businesses. All datasets are stored and hosted within the ABARES database.

In some cases, commodities data may not have been collected for the entire period. Data may also be unavailable if they are deemed confidential and subsequently restricted from the public domain by the ABS. These result in data gaps in the time-series.

ABS changed the way it reported its horticultural commodities information for the 2007–08 and 2008–09 financial years. This led to the addition of two new variables–the number of plants and crop yield per plant.

Visualisation and web delivery

For each variable, the data have been displayed using maps and time-series graphs. The maps present a snapshot of each variable for a given financial year, on a national scale. The time-series graphs present a longitudinal view of each variable for a user-selected region.

The maps were created for each variable by allocating all the data in a given year to predefined categories and colour coding each statistical division accordingly.

The time-series graphs present data for a single region. Users have the ability to choose a time period to analyse from the available record (1983-84 to 2008-09). The time-series graphs present data from the first and last years of the period selected by the user. Excluded years or years with no data are represented as breaks in the time-series.

Results

Online outputs

All 81 commodities are selectable individually and also as part of 10 higher-level groupings. Detail on the sorting of the 81 commodities into the higher-level groupings is provided in Attachment A.

Outputs include a set of time-series graphs and a set of maps for each selected commodity. Users can access the analyses through a series of drop-down menus: Resource type, spatiality, commodity, variable and date range.

The following time-series graphs and maps for each of the 81 commodities are displayed in the Hortstats website subject to availability of data for the commodity:

- Production in tonnes
- Area planted to crop in hectares
- Number of plants
- Crop yield per hectare
- Crop yield per plant
- Value of production in dollars, and
- Number of respondents.

Examples of outputs are shown in Attachment B.

The spatial maps are currently displayed only at a national level, due to limitations with the coding of the Hortstats web interface. With some customisation of the web interface it would be possible for spatial map information to be selectable at a number of regional levels. The maps

provide information on the distribution of horticulture production across Australia and allow comparisons on the production of a commodity to be made between regions. With the exception of yield, the proportion of the national total for a given variable is attributed to each statistical division. Yield anomalies are shown across five classes ranging from high to low.

The time-series analyses are selectable at the regional level. Ideally the maps and graphs would be available for all available variables. However, some or all of the data may not be available for all regions.

3   Recommendations

A lack of reliable information is a key limitation in horticulture. This was highlighted in the industries FutureFocus plan released in 2008, which states that an information system is needed to underpin sound decision-making by business, policymakers and researchers. In relation to the purpose of this proposed information system FutureFocus stated that:

> Information is needed about a wide range of issues affecting the development of the horticultural industry. Good information will provide a solid factual basis on which discussion and debate can occur. The other valuable use of information is to provide a strong commercial, demand-driven culture across the industry, thereby raising expectations about future industry potential and performance.

The delivery of the Hortstats website takes the first step in bridging this information gap by providing statistical information on horticulture, which is of benefit to growers, industry leaders, researchers, policy makers and the general public.

HAL has indicated its long-term vision for the display of data on the Hortstats website. It is intended that in the future, production data from the ABS agricultural surveys currently available in Hortstats can be viewed in conjunction with wholesale national price data, levy scan data and gross value of production data. This comprehensive set of information would significantly improve decision making in horticulture in line with the industry's FutureFocus plan.

HAL has made a significant investment in recent years to establish an online information system through the funding of the 'Establish the Horticulture Statistics Database Online Analysis Capability' and the 'Online Interface for Horticulture Commodity Statistics' projects. The establishment of the Hortstats website takes the first step in a long-term strategy to support improved decision making in the horticultural industry.

To ensure that this investment continues to benefit future users of the Hortstats website– growers, industry leaders, researchers, policy makers and the general public–the data products and web services contained within it will need to be maintained and updated.

Recommendation 1

HAL should develop and endorse a maintenance contract for the continued delivery of data products and web services for the Hortstats website.

ABARES has successfully integrated production statistics for horticulture industries into the Hortstats website through the 'Online Interface for Horticulture Commodity Statistics' project. The inclusion of market price indicators with the following features is recommended:

- up to 100 market price indicators (specified by HAL) and updated monthly (weekly updates possible at a later date if required)
- options that allow for the combination of several price indicators in time-series graphs as specified by HAL
- data presentation in tabular form, and
- the ability to access raw data if permitted by the data custodian.

In extending the data in the Hortstats website, HAL should take into consideration the need for an information system that assists industry decision-making containing data sets that are easy to use, reliable and up-to-date. For example unlike production statistics, market data changes at a

rapid pace and should be updated at an appropriate frequency to ensure currency and maintain its relevance to decision makers.

Recommendation 2

HAL should further progress its plan to extend data on its newly released website to provide access to a broader range of up-to-date data relevant for planning and decision making in the horticulture industry.

Spatial maps in the Hortstats website are currently displayed only at a national level. The maps were created for each variable by allocating all available data in a given year to predefined categories and colour coding each statistical division accordingly. This approach provides information on the distribution of horticulture production across Australia and allows comparisons on the production of a commodity to be made between regions, but provides limited information as to the actual locations that these commodities are actually grown within the region.

Recommendation 3

HAL should refine its map-based production statistics outputs to clearly identify where horticultural production takes place within each statistical division.

HAL has a stated goal to establish an easy-to-use online database that centralises the disparate sources of data for horticulture industries. Through the delivery of the Hortstats website HAL has taken the first step in achieving this goal. Further investment is required for HAL to fully realise its goal to establish an online information system that centralises disparate sources of data.

In recommendation 2 and 3 of this report, ABARES has put forward recommendations to extend and refine the work already complete in the 'Online Interface for Horticulture Commodity Statistics' project. In addition to these recommendations, ABARES also sees opportunities to further develop the Hortstats website to provide additional functionality.

Future development options could include the design and functional requirements for the following features:

- an interactive mapping interface that enables direct access to spatial data
- the ability to compare several spatial data sets within one map (overlays)
- the inclusion of catchment scale Horticulture industry land use maps based on Australian Collaborative Land Use Mapping Programme (ACLUMP) data, and
- the inclusion of spatial data sourced from the Australian Water Availability Project (AWAP) like rainfall, soil moisture and evaporation.

In moving forward, HAL should use the experience of this project and the successful delivery of the Hortstats website to continue to meet is long-term vision to deliver an information system that better meets the business requirements of HAL and its stakeholders. For example, an enhanced information system could allow potential user to combine land use, production statistics, climatic and biophysical data within one interface.

Recommendation 4

HAL should consider further development options to provide additional features and functionality to the Hortstats website to better meet the business requirements of HAL and its stakeholders. This future development work should be informed through market research to identify user needs.

ABARES would welcome the opportunity to work with HAL to ensure that data products and web services contained within Hortstats are maintained and updated when future horticultural statistics become available. ABARES can also work with HAL to extend the data available in the Hortstats website to include a broader range of up-to-date data relevant for planning and decision making in the horticulture industry and to develop horticultural industry land use masks or overlays to clearly identify where horticultural production takes place within a region.

ABARES has presented HAL with a number of future development options which could provide additional functionality to the Hortstats website. ABARES is well placed to assist HAL implement these future development options.

Detailed proposals for the recommendations presented in this report, including maintenance, features and functionality, development time lines, milestones and estimated costs, will be submitted separately to HAL for discussion before the end of June 2011.

Attachment A - classification structure of horticulture commodities

Table 1 Classification structure of horticulture commodities available through ABARES web services

Higher-level Groupings	Commodity
Temperate fruits	Apples
	Cherries
	Citrus - Oranges
	Citrus - Other
	Nashi
	Olives
	Pears
	Prunes
	Stone Fruit
Tropical fruits	Avocados
	Custard Apples
	Mangoes
	Bananas
	Pawpaws/Papaya
	Pineapples
	Other tropical fruits
Grapes and berries	Berries
	Rubus Berries
	Strawberries
	Blueberries
	Grapes - Dried
	Grapes - Table
Nuts	Almonds
	Macadamia nuts
	Walnuts
	Other Tree Nut Growing
Root vegetables	Beetroot
	Carrots
	Fennel, bulb
	Garlic
	Ginger
	Onion
	Parsnips
	Potatoes - fresh market
	Radish (red & white)
	Swedes & turnips
	Sweet potatoes
Leafy vegetables	Asian vegetables
	Brussels sprouts
	Cabbage
	Herbs - other

|	
Leafy vegetables(cont.)	Herbs – parsley
	Lettuce, head - outdoor
	Lettuce, head - undercover
	Lettuce, looseleaf - outdoor
	Lettuce, looseleaf - undercover
	Silver beet & spinach
	Spring onions
	Leeks
Cucurbits	Cucumber - outdoor
	Cucumber - undercover
	Melons - honeydews
	Melons - other
	Melons - rock & cantaloupe
	Melons - water melons
	Pumpkins
	Zucchini & button squash
Other vegetables	Artichokes, globe
	Beans
	Broccoli
	Capsicum - outdoor
	Capsicum - undercover
	Cauliflower
	Chillies
	Eggplant
	Peas - fresh market
	Snow peas & sugarsnap peas
	Tomatoes - fresh market - outdoor
	Tomatoes - fresh market - undercover
	Asparagus
	Celery
	Mushrooms
	Sweet corn - fresh market
	Other vegetables
Processed vegetables	Potatoes - processing
	Peas, green - processing
	Tomatoes - processing
	Sweet corn - processing
Inedible	Turf
	Cut flowers
	Nursery- Out doors
	Nursery - Under cover

Attachment B - example Hortstats outputs.

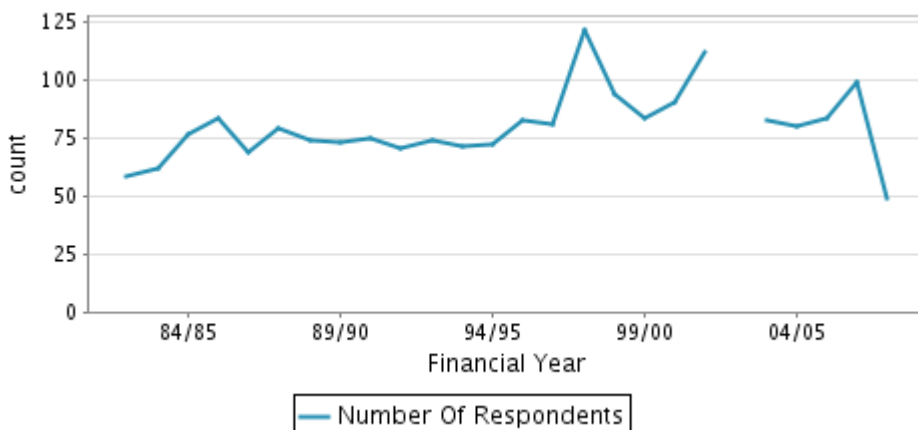**Figure 1 Time-Series Graph Outputs**

a) Broccoli production in the Melbourne Statistical Division - Area planted to crop
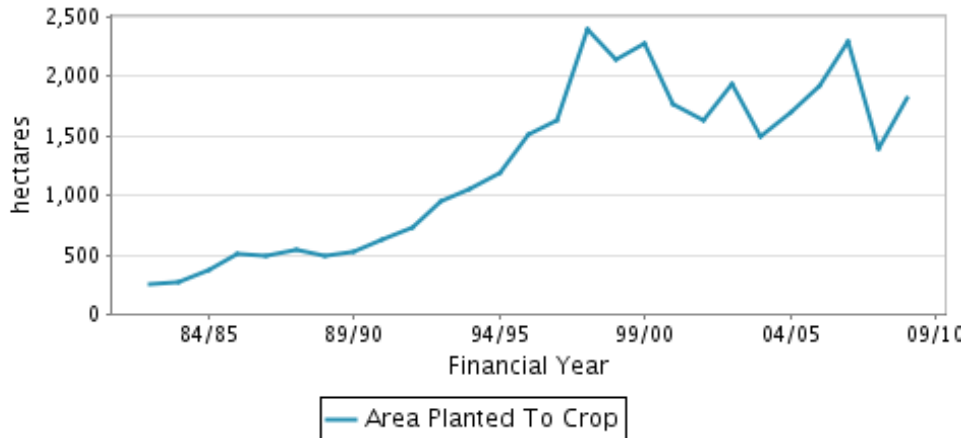
b) Broccoli production in the Melbourne Statistical Division -Crop yield per hectare
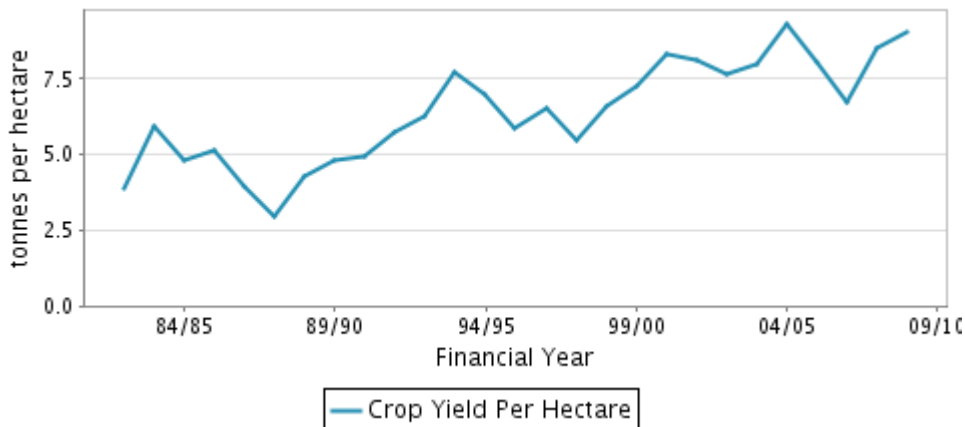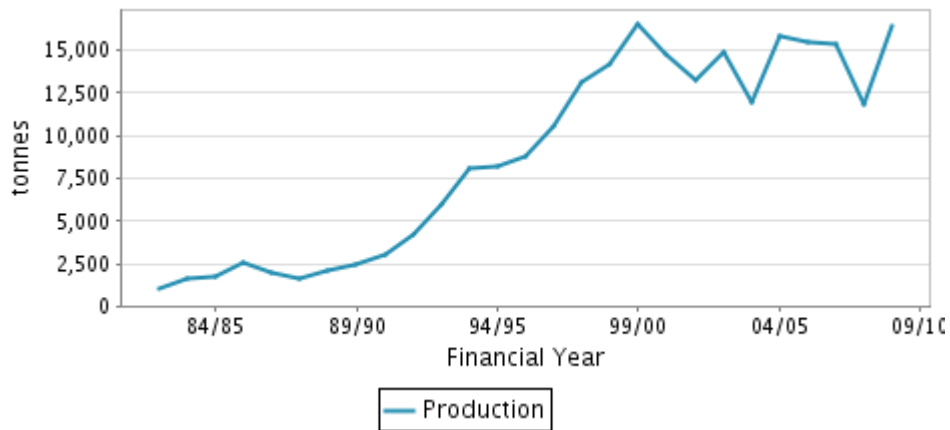

c) Broccoli production in the Melbourne Statistical Division -Number of respondents

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d) Broccoli production in the Melbourne Statistical Division - Production

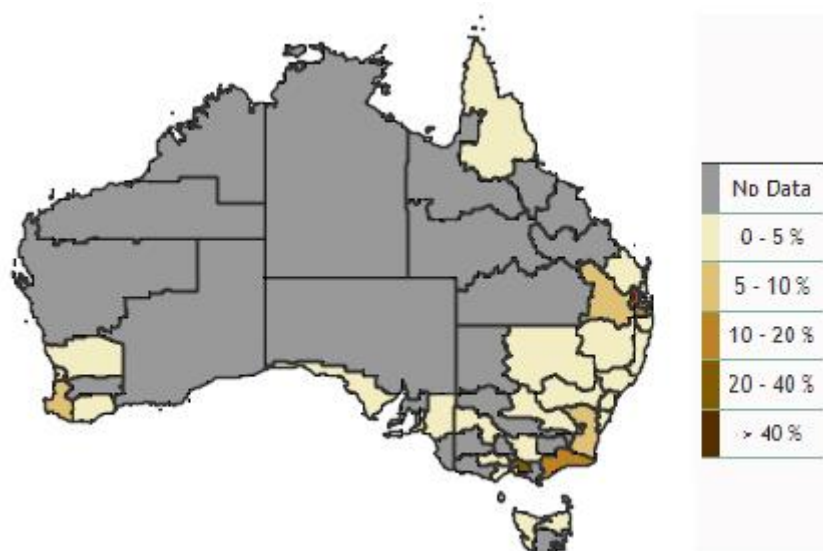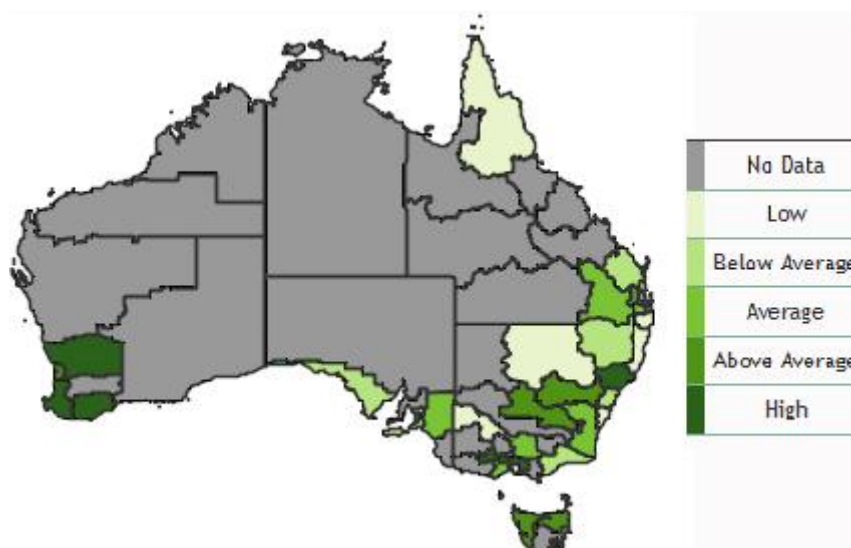**e) Broccoli production in the Melbourne Statistical Division - Value of production**
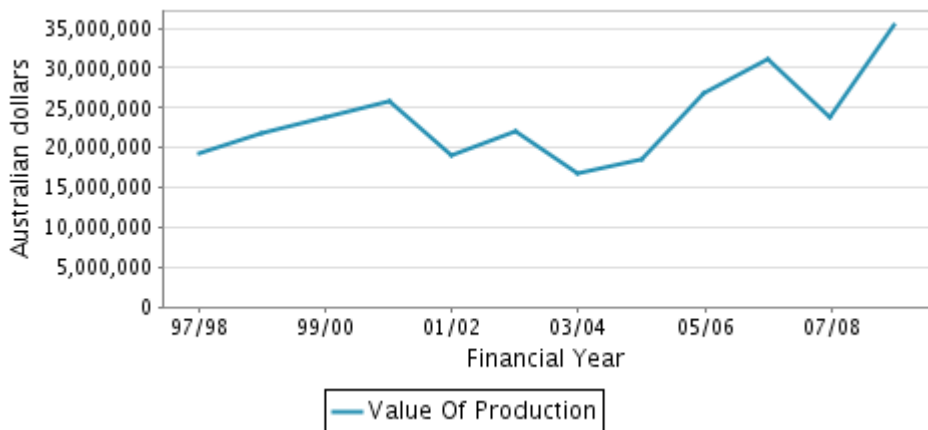
Figure 2 National Level Map Outputs

Were applicable values are presented in percent of national level values.
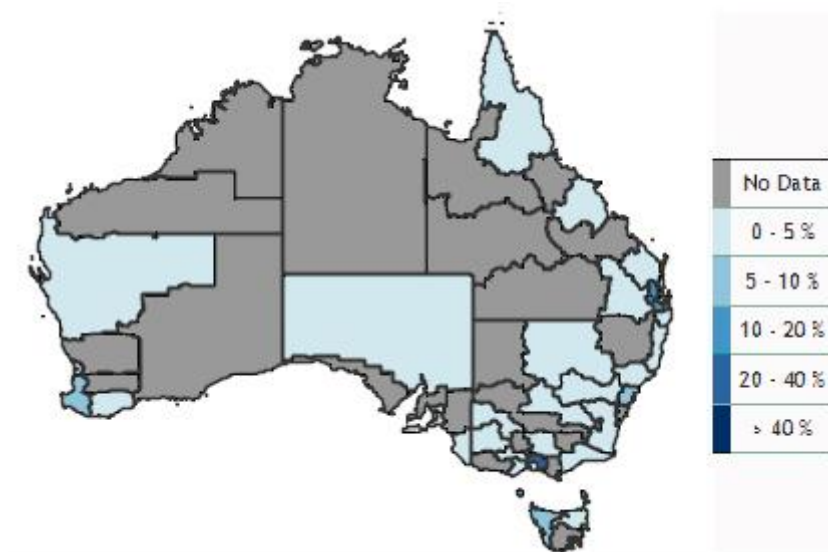
a) Broccoli production across Australia - Area planted to crop (2008–09)
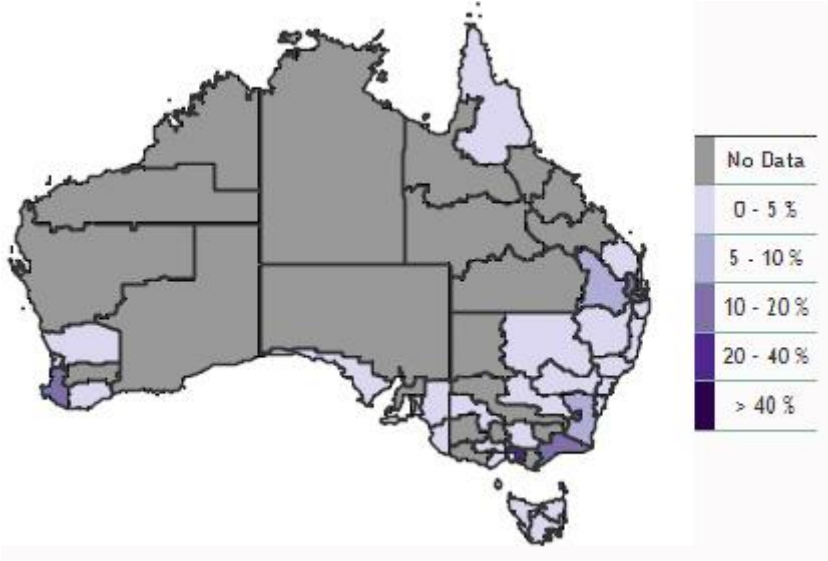

b) Broccoli production across Australia - Crop yield per hectare (2008–09)

c) Broccoli production across Australia -Number of respondents (2008–09)

d) Broccoli production across Australia - Production (2008–09)

e) Broccoli production across Australia -Value of production (2008-09)

e) Broccoli production across Australia -Value of production (2008-09)