

Economic survey of Australian vegetable growers, 2010-11, 2011-12 and 2012-13

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Final project report

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1 Summary

ABARES was commissioned by Horticulture Australia Limited (HAL) to conduct annual surveys of vegetable growing farms in order to develop a time series of data. The main objective of the project was to collect and disseminate representative data on the economic structure and financial performance of the Australian vegetable growing industry to assist industry stakeholders in developing plans for the long term direction of the industry.

Six surveys have now been undertaken covering the years from 2005–06 to 2011–12 with funding from HAL. This unique dataset provides a comprehensive time series of production and financial performance data, production intentions and issues of concern to Australian vegetable growing farms. This dataset has been used for informing industry and government about a range of issues facing the vegetable industry.

Annual summaries of results are published as part of ABARES [Industry Report](#) series. Each report includes a descriptive analysis of key results and trends as well as tables of data by commodity and state.

The last two reports were published in 2011 and 2012. The most recent survey data collection was completed in September 2013 and a draft final report was recently provided to HAL for comment.

Results from the surveys have been widely used to inform industry and government on issues affecting the financial performance of Australian vegetable growing farms. In addition, co-operators' reports are provided to each survey participant to enable them to compare their farm performance against other farms in the region.

For future surveys, ABARES has proposed to revise the survey methodology to specifically report on the performance of vegetable growing farms that produce vegetables covered under the National Vegetable Levy. As the time series extends, there will also be scope to provide some additional analysis on productivity.

2 Background

In 2006, the Australian Vegetable Industry Development Group (AVIDG) was established to provide an industry-wide perspective on setting directions for the sustainable growth of the industry. In developing an industry-wide strategic plan, *Vegvision 2020*, the AVIDG recognised a need for the vegetable industry to better understand the key drivers of physical and financial farm performance for vegetable growers.

To cover this information gap, the AVIDG commissioned ABARES to collect and analyse data on vegetable production, the financial situation of vegetable growers, and issues faced by growers. The initial survey was funded by the Australian Department of Agriculture (then known as the Department of Agriculture, Fisheries and Forestry).

In 2008, ABARES was commissioned by Horticulture Australia Limited (HAL) to conduct annual surveys of vegetable growing farms in order to develop a time series of data based on the initial survey.

Six surveys have now been undertaken covering the years from 2005–06 to 2011–12 with funding from HAL. This unique dataset provides a comprehensive time series of production and financial performance data, production intentions and issues of concern to Australian vegetable growing farms. This dataset has been used for informing industry and government about a range of issues facing the vegetable industry.

The most recent survey data collection was completed in September 2013. A draft final report was recently provided to HAL for comment.

This document is the final report for the project undertaken by ABARES on behalf of HAL. It provides a summary of the project and resulting outcomes.

3 The project

Objective

The main objective of the project is to collect and disseminate representative data on the economic structure and financial performance of the Australian vegetable growing industry to assist industry stakeholders in developing plans for the long term direction of the industry.

To achieve this, ABARES designed a survey to collect comprehensive production and financial performance data, production intentions and issues of concern to Australian vegetable growing farms. Each year since 2008, production and financial information were collected for the preceding financial year and projections of financial performance for the financial year in question. For example, the most recent survey collected production and financial performance data for 2011–12 and projections of financial performance for 2012–13. The previous three surveys were developed following extensive discussions between ABARES, HAL and AUSVEG, and after taking into account feedback received by the industry following the vegetable industry survey conducted in 2007.

The six surveys conducted so far provide the industry with a unique time series database that can be used by industry and government in evidence based decision making, and to monitor changes occurring within the industry.

Methodology

Target population

The vegetable survey is designed from a frame (population list) drawn from the Australian Business Register (ABR) maintained by the Australian Bureau of Statistics (ABS). The ABR based frame provided to ABARES consists of agricultural businesses registered with the Australian Taxation Office, together with their corresponding statistical local area, industry classification and size of operation variable. The size variable is an indicator of the extent of agricultural activity.

ABARES surveys target vegetable establishments that make a significant contribution to the total value of agricultural output (commercial farms). Farms excluded from ABARES surveys will be the smallest units, and in aggregate will contribute little to the total value of vegetable production.

The vegetable growing industry definition is based on the Australian and New Zealand Standard Industrial Classification (ANZSIC). This classification is consistent with an international standard applied comprehensively across Australian industry, permitting comparisons between industries, both within Australia and internationally. Farms assigned to a particular ANZSIC class have a high proportion of their total output characterised by that class. Further information on ANZSIC and on the vegetable growing industry is provided in Australian and New Zealand Standard Industrial Classification (ABS 2006, cat. no. 1292.0).

For purposes of this survey, vegetable farms in the sample were selected from units classified in ANZSIC 0122 (Vegetable growing, under cover) and 0123 (Vegetable growing, outdoors). These classes consist of units engaged mainly in growing vegetables, with primary activities including capsicums, cucumbers, herbs, lettuces, tomatoes, asparagus, beans, carrots, garlic, zucchinis, onions, peas and potatoes.

Survey design and sample weighting

The target population is grouped into strata defined by state and size of operation. The size of each stratum was determined using Dalenius-Hodges method (Lehtonen & Pahkinen 2004). The sample allocation to each stratum is a compromise between allocating a higher proportion of the sample to strata with high variability in the size variable and an allocation proportional to the population of the stratum.

Results are based on vegetable farms that responded to the survey (Table 1). Farm-level estimates published in the report are calculated by appropriately weighting the data collected from each sample farm and using the weighted data to calculate population estimates. Sample weights are calculated so that population estimates from the sample for numbers of farms and areas of vegetables planted correspond as closely as possible (at a state level and by groups of farms by area of vegetables planted) to the most recently available ABS estimates from data collected in the Agricultural Census and Agricultural Survey. The weighting process ensures estimates are applicable for all commercial vegetable growing farms rather than just those in the sample.

Table 1 Realised sample size, 2005–06 to 2011–12

	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12 a
New South Wales	34	38	39	42	41	46	37
Victoria	53	51	45	43	54	50	41
Queensland	55	59	68	69	72	66	54
South Australia	30	37	48	46	52	51	48
Western Australia	32	40	38	34	32	37	31
Tasmania	49	48	37	32	35	36	30
Northern Territory	8	12	13	13	.	.	.
Australia	261	285	288	279	286	286	241

a This number will be higher in the final report.

Note: Northern territory was excluded from the survey results after 2008–09 following the change in definition of a vegetable growing farm by the Australian Bureau of Statistics.

Source: ABARES vegetable farm survey.

The weighting methodology for the vegetable survey uses a model-based approach with a linear regression model linking the survey variables and the estimation benchmark variables. The details of this method are described in Bardsley and Chambers (1984).

Benchmark variables used to weight the data provided by the ABS include:

- total numbers of farms in scope
- total area planted to vegetables for human consumption.

Generally, larger farms have smaller weights and smaller farms have larger weights, reflecting the strategy of sampling a higher fraction of larger farms than smaller farms (the former having greater variability of key characteristics and accounting for a much larger proportion of total output) and the relatively lower number of large farms.

Survey questionnaire

The survey of vegetable growing enterprises covered the following topics

- Pre-interview questions, to:

- determine eligibility and stratification level
- establish business structure and activities
- confirm address and location
- check availability of financial and production data.
- Production details
 - Vegetable-related production for the survey year.
 - Details of each type of product (including quantity produced, sales, transfers and stocks on hand).
- Labour
 - Family and hired labour.
 - Workers' status in the operation, hours worked and wages paid.
 - Questions about operators' and spouses' education, off-farm work and government assistance.
- Assets
 - Type and value of liquid assets (owned by or available to the business), land, vehicles, plant and equipment, and buildings and other structural improvements used in the business.
- Liabilities
 - Details of farm debt.
- Income and expenses
 - All costs and income associated with the vegetable business.
- Supplementary survey questions covering a range of issues, including:
 - irrigation water and chemical usage
 - pests and diseases
 - farm sale outlets
 - sources of information
 - future intentions
 - constraints
 - relationship of growers with main buyers.

Preliminary estimates and provisional projections

Production and financial information were collected in each year for the preceding financial year. Some preliminary projection data are also collected for the next financial year.

For example, in the collection of data for the 2013 report, estimates for 2010–11 and all earlier years are final. All data from farmers, including accounting information, have been reconciled, final production and population information from the ABS has been included and no further change is expected in the estimates.

The 2011–12 estimates are preliminary based on full production and accounting information from farmers. However, editing and addition of sample farms may be undertaken and ABS production and population benchmarks may also change.

The 2012–13 estimates are provisional projections developed from the data collected through on-farm interviews undertaken between February and October, as well as from the preliminary estimates. Projection estimates include crop and livestock production, receipts and expenditure up to the date of interview, together with expected production receipts and expenditure for the remainder of the projection year. Modifications are made to expected receipts and expenditure where significant production and price change has occurred post-interview. Provisional projection estimates are subject to greater uncertainty than the preliminary and final estimates.

Preliminary and projection estimates of farm financial performance are produced within a few weeks of completion of survey collections. However, these may be updated several times at later dates. These subsequent versions will be more accurate, as they will be based on upgraded information and slightly more accurate input datasets.

Sampling errors

Only a subset of farms out of the total number of farms in a particular industry is surveyed. The data collected from each sample are weighted to calculate population estimates. Estimates derived from these farms are likely to be different from those that would have been obtained if information had been collected from a census of all farms. Any such differences are called 'sampling errors'.

The size of the sampling error is most influenced by the survey design and estimation procedures, as well as the sample size and variability of farms in the population. The larger the sample size, the lower the sampling error is likely to be. Hence, national estimates are likely to have lower sampling errors than industry and state estimates.

To give a guide to the reliability of the survey estimates, standard errors are calculated for selected estimates. These estimated errors are expressed as percentages of the survey estimates and termed relative standard errors (RSEs).

4 Outcome

Annual summaries of results are published as part of ABARES *Industry Report* series. Each report includes a descriptive analysis of key results and trends as well as tables of data by commodity and state. The reports are freely available for download at <http://www.daff.gov.au/abares/publications>.

In 2011 and 2012 the following reports were completed and published online:

- Thompson, T 2011, Australian vegetable growing farms: an economic survey, 2009–10, ABARES report to client prepared for Horticulture Australia Limited, Canberra, November.
- Thompson, T & Zhang, K 2012, Australian vegetable growing farms: an economic survey 2010–11 and 2011–12, ABARES research report 12.11 prepared for Horticulture Australia Limited, Canberra, December.

The most recent survey data collection was completed in September 2013. A draft final report was recently provided to HAL for comment.

Observations

The main observations from the 2011 and 2012 vegetable industry reports are summarised here. Estimates and projections for 2011–12 and 2012–13 will be available when the report is published online in November 2013.

2009–10

- Vegetable growers indicated that seasonal conditions in 2009–10 were better than in 2008–09. An estimated 36 per cent of vegetable growers indicated they experienced drought or below average seasonal conditions in 2009–10 compared with 40 per cent in the previous financial year.
- Total cash receipts for vegetable farms in 2009–10 are estimated to have averaged \$707 700 per farm, of which 81 per cent was derived from the sale of vegetables. Vegetable receipts are estimated to have remained fairly constant between 2008–09 and 2009–10, with the average quantity of vegetables sold remaining stable and only a slight fall in average farmgate prices.
- Total cash costs averaged around \$565 600 per farm in 2009–10, which was an increase of 5 per cent over the previous financial year. On average, hired labour again accounted for the largest share of cash costs per farm in 2009–10.
- The average farm cash income for vegetable farms in 2009–10 was \$142 000 per farm, which was around 8 per cent lower than the previous financial year. The fall in average farm cash income was due largely to higher costs.
- The proportion of vegetable farms realising negative farm cash income increased from 12 per cent in 2008–09 to 17 per cent in 2009–10.
- Vegetable farms had an estimated average rate of return to capital, excluding capital appreciation, of 2.8 per cent in 2009–10. Larger farms, with more than 70 hectares of vegetables planted, realised a higher average rate of return to capital, excluding capital appreciation, of 5.5 per cent.

- The equity ratio (business assets as a percentage of total farm capital) of vegetable farms remained high in 2009–10, averaging 84 per cent, although this was slightly lower than the previous financial year because of higher average debt. Only an estimated 5 per cent of vegetable farms had both an equity ratio of less than 70 per cent and a negative farm cash income.
- Almost all vegetable growers were concerned about pests and diseases. An estimated 92 per cent of growers followed a set pest and disease monitoring program and the level of on-farm pest and disease monitoring has increased over the past four years.
- At the time of the survey, an estimated 64 per cent of vegetable growers expected to still be engaged in vegetable production in five years time. Additionally, 22 per cent of vegetable growers intended to expand vegetable production in the next three to five years.
- The most common factor that growers considered to be an impediment to future viability of vegetable growing was increased farm input costs. Most vegetable growers also highlighted marketing costs and low farmgate vegetable prices as other impediments to future viability.

2010–11

- A lower proportion of vegetable growers indicated experiencing drought or below average seasonal conditions in 2010–11 than in 2009–10. An estimated 26 per cent of vegetable growers indicated that they experienced drought or below average seasonal conditions in 2010–11 compared with 36 per cent in the previous financial year. However, 21 per cent of vegetable growers experienced flood conditions.
- Average vegetable yields per farm are estimated to have fallen by 12 per cent in 2010–11 to 27 tonnes per hectare, mainly reflecting production losses due to heavy rain and flood damage in a number of vegetable growing regions.
- Total cash receipts for vegetable farms in 2010–11 are estimated to have averaged \$792 200 per farm, of which 84 per cent was derived from the sale of vegetables. On average, vegetable receipts are estimated to have increased between 2009–10 and 2010–11, with an increase in farmgate prices more than offsetting the lower quantity of vegetables.
- Total cash costs averaged around \$630 600 per farm in 2010–11, which was an increase of 11 per cent over the previous financial year. On average, hired labour accounted for the largest share of cash costs per farm in 2010–11.
- Farm cash income for vegetable farms in 2010–11 was on average \$161 600 per farm, which was around 14 per cent higher than the previous financial year. The rise in average farm cash income was largely due to higher prices received for vegetables.
- Vegetable farms had an estimated average rate of return to capital, excluding capital appreciation, of 2.9 per cent in 2010–11. Larger farms, with more than 70 hectares of vegetables planted, realised a higher average rate of return to capital, excluding capital appreciation, of 5.1 per cent.
- The equity ratio (business assets as a percentage of total farm capital) of vegetable farms remained high in 2010–11, averaging 84 per cent. Only an estimated 5 per cent of vegetable farms had both an equity ratio of less than 70 per cent and a negative farm cash income.
- At the time of the survey, an estimated 72 per cent of vegetable growers expected to still be engaged in vegetable production in five years time. Additionally, 18 per cent of vegetable growers intended to expand vegetable production in the next three to five years.

2011-12

- Average vegetable yields per farm are estimated to have increased by 9 per cent in 2011-12 to 30 tonnes per hectare following improved seasonal conditions.
- The average total cash receipts for Australian vegetable farms are estimated to have increased in 2011-12 to \$810 000 per farm, with an increase in average vegetable production offsetting the decrease in farmgate vegetable prices.
- The average area planted to vegetables is estimated to have remained stable in 2011-12 at 38 hectares per farm. Total cash costs are also estimated to have been similar to the previous financial year at \$632 000 per farm.
- The average farm cash income for vegetable farms is estimated to have increased by around 11 per cent to \$179 000 per farm. This increase was mainly due to higher average receipts.

5 Conclusions

Results from the surveys have been widely used to inform industry and government on issues affecting the financial performance of Australian vegetable growing farms. The survey is the only source of data on both the physical and financial information about vegetable farms at state and national levels, and has been used in a wide range of briefings to HAL, the Australian and state governments, and published annually in AUSVEG's magazine *Vegetables Australia*. The published findings and analysis from the surveys conducted so far are freely available to growers and industry stakeholders on the ABARES website, and have been widely cited in a number of other online publications (see selected online citations).

In addition, co-operators' reports are provided to each survey participant to enable them to compare their farm performance against other farms in the region, allowing growers to enhance their financial performance, resource allocation and investment decisions.

For future surveys, ABARES has proposed to revise the survey methodology to specifically report on the performance of vegetable growing farms that produce vegetables covered under the National Vegetable Levy. In the short term, ABARES proposes to provide some retrospective analysis on the sample of farms already collected by excluding those that only grew vegetable crops *not* covered by the National Vegetable Levy (that is, potatoes, tomatoes, garlic, asparagus and onions). The results will provide an indication of the physical and financial performance of farms that grew crops covered under the National Vegetable Levy.

As the time series extends, there will also be scope to provide some additional analysis on productivity.

Selected online citations

Recent use of the survey data in research published by other organisations:

Report Ashton, D 2007, Australian vegetable growing industry: an economic survey 2005–06. ABARE Research project 07.17, Prepared for the Australian Vegetable Industry Development Group, Canberra, October.

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