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The evolution of agricultural statistics in Australia



The Evolution of Agricultural Statistics in Australia

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The Evolution of Agricultural Statistics – History

The Agricultural Industry has been at the forefront of development in Australia. Statistics have informed the nation's understanding of this industry which has been vital to Australia's prosperity.

Farming in Australia had humble beginnings. Three months after the arrival of the 'first fleet' in January 1788, the livestock in the colony consisted of: 7 horses; 7 cattle; 29 sheep; 74 pigs; 5 rabbits; 18 turkeys; 29 geese; and 209 fowls. Two years after the arrival of the first fleet from England, Captain Arthur Phillip assigned land to the ex-convict James Ruse. This was the first land grant in Australia for the purpose of establishing farming on a larger scale. For the first farmers, the challenges were all about adapting to Australian conditions. This emphasis remains today, with droughts, floods, storms and bushfires often affecting agricultural production.

Agricultural area and production data has been collected for key commodities such as wheat, barley, sheep and cattle since settlement, providing a picture of the development of the agricultural industry in Australia. By the 1860's, after only 70 years of European farming settlement, there were 1.2 million acres (480,000 hectares) under crop and livestock numbers had increased to 25 million head.

Prior to Federation in 1901, data was collected annually by each Australian colony and reported back to England. After Federation, each state continued to collect data, with data collection occurring in different formats and by a range of different individuals, for example, police officers. In 1901, there were over 83 million head of livestock with 8.8 million acres (3.6 million hectares) under crop. Some 23% of the total population were employed directly in the agricultural and pastoral industries.

During the 1920s and 1930s, Australia's agricultural production increased rapidly due to new and improved technologies, including the introduction of more productive grain varieties and advances in livestock breeding techniques. Agricultural production expanded beyond the needs of the Australian population, and Australia became one of the world's major food exporters.

In 1930, the world wide depression resulted in the closure of Australian factories and seriously affected commodity prices. The outbreak of World War II in 1939 presented a new challenge, with a detrimental effect on Australian trade in agricultural products. Trade in agricultural products in 1938 was valued at 39.8 million Australian pounds. This value continued to decline until 1943 where it reached a low of 14.8 million pounds. Following this, the value of exports of agricultural products began to steadily increase again, reaching 50.6 million Australian pounds in 1947.

During World War II the government developed policies to maintain the agricultural production necessary to feed and clothe service personnel during the War; for example, the cotton industry significantly expanded with the government offering incentives on all cotton yarn manufactured in Australia which contained a minimum 50% of home grown cotton. With these incentives and improved irrigation, the area planted to cotton increased from an average of 15,000 hectares per annum in the ten years to 1930, to around 24,300 hectares in the early 1940s, with production dropping away after the end of the War.

In 1946, the gross value of wool production represented 17% of the total value of production of all agricultural industries. By 1951 this had risen to 56%. This was the period that Australia was said to be

‘riding on the sheep’s back’. During the 1950s the agricultural industry contributed 15-20% to Australia’s gross domestic product (GDP), 75% to Australia’s total exports and accounted for 10% of employment. The two decades following 1960 saw expansion into new areas of agricultural production as new markets for Australian commodities were identified and established, most notably the expansion into the production of oilseeds, including safflower and linseed oil.

During this period, the long term effects of stocking rates and cultivation techniques contributing to land degradation were scientifically documented and publicly debated. The increasing salinity of Western Australian wheat lands and the rapidly increasing water tables of the Murray and Murrumbidgee irrigation areas were two issues of particular concern.

The identification of the link between farming practices and land degradation issues led to primary producers increasingly analysing the long term effects of individual management practices. Improvements in farming techniques, such as crop rotation, were encouraged and practices such as improving water conservation through application techniques and native revegetation were adopted to halt and reverse (where possible) the damage that had already occurred to much of the land already farmed in Australia. By the mid-1990s the agricultural industry’s contribution to Australia’s GDP had fallen to 3%. The contribution of agriculture to total exports had dropped from around 75% to 28%, and agriculture accounted for less than 5% of Australia’s employment, down significantly from 10% in the 1950s.

In 2012, saying that Australia ‘rides on the sheep’s back’ no longer describes Australia’s economy, or even Australian agriculture. Mining, manufacturing, service industries and construction have outstripped agriculture in relative importance to the economy; however, Australian farmers have continued to make significant gains in productivity. For example, in 1967, less than 50 years ago, Australia’s dairy cattle herd was producing around 2,380 litres of milk per cow annually. In 2011, annual production had more than doubled to 5,675 litres per cow.

Increases in productivity have occurred due to a combination of factors, including the adoption of innovative farming techniques, scientific developments in areas such as plant and animal breeding, and improvements in management of crops, livestock, land, water and pests. Supporting these innovations is the increased availability and use of sophisticated machinery and information technology that allow farmers to better manage their production and natural resources.

Agriculture in Australia utilises a large proportion of the country’s natural resources – agricultural activity is undertaken on 52% of Australia’s land area and accounts for 52% of total water use. With farmers using over half of Australia’s landmass, managing land and water-based natural resources is critically important, both environmentally and economically.

The adoption of new technologies is increasingly important as farmers try to maintain levels of profitability in the face of: rising costs; variable terms of trade; and restrictions on land use-and farming practices, as Australia becomes more aware of the need to develop farming practices that support environmental and economic sustainability.

The Evolution of Agricultural Statistics – The Present Day

With the move to new and sustainable farming practices, the Australian Bureau of Statistics (ABS) has experienced increasing demands from users for information on how the agricultural industry in Australia

is using the land and associated natural resources. There has also been an increasing focus on understanding the impact of the industry and its management practices on the environment. As the information needs of users have evolved so has the ABS' Rural Environment and Agriculture Statistics Program. The program has expanded beyond the collection of agricultural commodity data to include the collection of water and land management data. For example:

- In 2003, the ABS ran its first comprehensive Water Survey of the agricultural industry which collected data on supply, use and irrigation methods;
- In 2005, the ABS ran its first Natural Resource Management Survey which collected data on the management of natural vegetation, weeds and pests, land and soil management, water management and farm management in relation to natural resources. This survey was conducted in parallel with the annual commodity survey;
- In 2008, the ABS ran its first Agricultural Resource Management Survey. This survey was an evolution of the Natural Resource Management Survey which was combined with the annual commodity survey.

While still providing traditional agricultural and resource management data, and in order to remain relevant and keep pace with rapidly evolving data needs, the ABS has increased strategic engagement and implemented an ongoing review process for the Rural Environment and Agriculture Statistics Program. The ongoing review process was initiated through a Survey Program Review (SPR) which was driven by the necessity to assess the relevance of the ABS' Rural Environment and Agriculture Statistics Program, ensuring its continued flexibility in light of the increasingly dynamic nature of national and international environmental and agricultural policy directions. The SPR has been progressed through a number of phases, including the release of a discussion paper, extensive stakeholder engagement and consideration of international and national developments in the area of environment and agricultural statistics. A key international driver which was considered by the ABS to inform the SPR was *The Global Strategy to Improve Agricultural and Regional Statistics* (FAO and the World Bank, 2011). This strategy came as a response to the declining quantity and quality of agricultural statistics and the need to provide relevant statistical information to support emerging data requirements on an international and national level. The key indicators, data items and variables outlined in the strategy form the information required to provide a coherent picture of agricultural production globally.

The ABS undertook extensive stakeholder consultations to inform the SPR. Key messages coming from stakeholder consultation and submissions to the discussion paper included:

- a continued need for agricultural commodity data, particularly at regional geographical levels;
- an increasing emphasis on environment and land use data; a need for a consistent set of data to be collected over a period of time;
- a survey program that retains the flexibility to deliver the information required in a dynamic policy environment; and
- the need for the ABS to assume a greater leadership role as a facilitator in the wider statistical community.

The key outcome in respect to the Rural Environment and Agriculture Statistical Program is a commitment to collecting a core set of agricultural data items and land management practices themes up until the next Agricultural Census which will be undertaken in 2016.

As result of the SPR and through increased strategic engagement and greater collaboration between the ABS and key users of environment and agricultural data, the Rural Environment and Agriculture Statistics Program is better positioned to provide the statistical assets required to support evidenced based policy development.

Currently the ABS, through the Rural Environment and Agriculture Statistics Program, is providing information to support several key national policy areas including:

- Caring for our Country – this Australian Government initiative aims to achieve an environment that is healthy, better protected, well managed, resilient and provides essential eco-system services in a changing climate. In order to achieve a measurable difference to Australia's environment, Caring for our Country funds projects across Australia to achieve national targets in regard to sustainable farm practices.
- The Carbon Farming Initiative (CFI) – this Australian Government initiative is a carbon offset scheme that allows farmers and land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land. These credits can then be sold to people and businesses wishing to offset their emissions. The CFI also aims to encourage sustainable farming and provide a source of funding for landscape restoration projects.
- The National Greenhouse Accounts – this Australian Government initiative monitors and accounts for Australia's greenhouse gas emissions from land based sectors through the National Greenhouse Gas Inventory. Australia's National Greenhouse Accounts conform to the international guidelines adopted by the United Nations Framework Convention on Climate Change.

Emerging areas of interest where data from the Rural Environment and Agriculture Statistics Program is being sought to support policy development include: food security; ownership of Australian agricultural assets; biodiversity; and biosecurity.

The Evolution of Agricultural Statistics – The Future

In order to meet and exceed the needs of all users of environment and agricultural data into the future, the outcomes of the SPR have fed into the ABS's Information Management Transformation Program.

For the ABS to continue to provide high quality, objective and responsive information for informed decision making, a transformation in the way in which the ABS manages information from collection through to dissemination will be implemented.

This transformation will provide stakeholders, such as those in the agricultural statistical community, with access to information that is easily and rapidly located and used, reliable and comparable. This transformation will be achieved by upgrading infrastructure, refining the ways in which data is acquired, and modernising the way in which the ABS communicates and disseminates statistical information.

To improve the management of the statistical information which the ABS currently delivers, the ABS is developing a coherent and integrated environment for the life-cycle management of statistical data, which will be significantly more responsive and adaptable than current approaches and systems allow. This includes the harmonisation of statistical processes, methods, information management approaches and supporting information and communications technology (ICT) applications, followed by training in the new approaches, and the migration of processes and data from the existing to the new environment.

Australia is not alone in facing demands for better management of statistical information. Many other countries face the same challenges. The harmonisation of statistical production and information management approaches needed within the ABS is also needed by many other National Statistical Organisations (NSOs). The ABS is collaborating with other NSOs to develop the next generation of statistical infrastructure. Five collaborative projects are currently underway (Operationalise a common metadata information management framework - OCMIMF; data editing; web-based 'e-form' data capture; disclosure control; and innovation in dissemination).

The vision of Rural Environment and Agriculture Statistics program over the next five years aligns with the vision of the ABS's statistical business process and information management transformation program. That is, to provide data users with access to rural environment and agriculture information that is easily and rapidly located and used, reliable and comparable.

In order to achieve this vision over the next five years, ABS's role in the Australian rural environment and agriculture statistics context will shift from being primarily a collector of information, towards acting increasingly as a leader and facilitator of national and international statistical communities.

This move away from being an agency with a focus on data collection means the future for rural environment and agriculture statistics in Australia will see more attention being placed on statistical data integration and the use of administrative data to complement and replace survey data. By focussing on these areas in coming years, the expected improvements and efficiencies from data acquisition through to dissemination from the required technological advancements will help ensure that the vision for rural environment and agriculture statistics will come to fruition.

A key initiative being led by the National Statistical Service within the ABS is the Statistical Data Integration Program. Statistical data integration involves integrating data from different sources to provide new datasets for statistical and research purposes. Bringing together data in a controlled, secure and transparent manner will enhance the value of Australia's statistical assets for informed decision

making. However, poorly managed data linkage activities could significantly impact on community trust and the over-all value of Australia's statistical assets. A focus of the Statistical Data Integration Program is therefore on balancing the gains and the risks in a cooperative, productive and transparent manner consistent with all relevant legislation.

Statistical data integration is also an opportunity for communities and governments to increase their understanding of their region. For users of environment and agriculture statistics the integration of data, for example, spatial data (such as satellite imagery) and survey data will increase the value of the data currently available. Integrating data at a regional level will provide greater context to the inter-relationships between environmental conditions and agricultural practices, for example, the impact of drought agricultural productivity and the consequential economic impact of this on a rural community. A further ABS initiative is the expanding use of administrative data. Administrative Data consists of information collected about a population either directly or indirectly, for purposes other than that of a statistical nature, such as for taxation purposes.

NSOs need to find new and improved ways of acquiring information about their target populations to reduce respondent burden, maximise available data usage and find efficiencies in the use of finite resources for data collection. For the Rural Environment and Agriculture Statistics Program, the utilisation of administrative data to reduce respondent burden, while still providing a holistic and rich statistical picture of inter-relationships between environmental conditions and agricultural practices in Australia, will ensure the most efficient use of resources and effective use of Australia's data assets. From its humble beginnings the Australian agricultural industry has continued to evolve to the diverse industry it is today. As the industry has evolved, so too has the need for information to understand the industry and its impact on the Australian environment. While advancements in technology support modernisation of data collection and dissemination technologies, they also underpin the increasing demands from data users for immediate access to information. With this increasing demand for information, ongoing engagement and program review will be critical to ensure the Rural Environment and Agriculture Statistics Program remains relevant and timely to support evidenced based policy development in Australia.

The Evolution of Agricultural Statistics – Sources

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[http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/7B268DE64F791420CA2569DF00012F05/\\$File/13010_2001.pdf](http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/7B268DE64F791420CA2569DF00012F05/$File/13010_2001.pdf) (Subject: Research for Pilot Literacy Strategy; Database: Tas CMU WDB; Author: Erica Galloway; Created: 22/02/2011; Doc Ref: EGAY-8EB2XL)

3. 2000 Year Book Australia – ‘A Hundred Years of Agriculture’

4. Historical Selected Ag Commodities, by State (1861 to Present), 2009-10 (cat. no. 7124.0)

5. [Global Strategy to Improve Agricultural and Rural Statistics, published September 2010](#)

The purpose of the Global Strategy is to provide a framework for national and international statistical systems that enables them to produce and to apply the basic data and information needed to guide decision making in the twenty-first century.