

Analysis of price premiums under the South Australian GM moratorium

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Executive summary

The South Australian Government have continued the moratorium on the cultivation of GM crops until 2025. The moratorium was extended based on the presumption of premium prices are being achieved by South Australian farmers as a result of the status as a GM-free state.

It is important that thorough research is conducted by experienced industry analysts to substantiate the presumption of premiums attained by South Australian farmers. This report is the most exhaustive analysis produced to date of the premiums and discounts achieved by farmers in South Australia, covering commodities which contribute approximately 63% of the state's agricultural economy.

The results demonstrate overwhelmingly that the majority of farmers in South Australia do not receive a premium as a result of the moratorium. The only agricultural commodity with a premium over a comparable market is pork, albeit a very slim premium, and likely based on supply and demand factors as opposed to the moratorium and subsequent marketing opportunities.

It is our opinion, supported by economic analysis, that the moratorium in South Australia has not led to enhanced premiums over comparable markets to farmers producing the following commodities:

- wheat
- barley
- canola
- wine grapes
- wool
- cattle
- sheep and lamb.

There is a slight premium for pork prices in South Australia, however it is not possible to determine whether this is due to the moratorium.

Despite GM canola being the only GM crop currently grown in Australia that is likely to be adopted by SA farmers; the additional agricultural commodities were included in this analysis to test the presumption that the GM moratorium provides a premium to other South Australian agricultural commodities.

Our analysis demonstrates that the GM moratorium removes the option of utilising innovative agronomic tools, licenced by the Gene Technology Regulator (GTR) as safe, with little in the way of trade and marketing benefit to the majority of agricultural producers in South Australia.

We have found no evidence to suggest that the repeal of the moratorium, and the introduction of GM canola, would lead to any reduction in comparable prices to South Australian farmers.

Project overview

This report has been independently produced by Mecardo, under commission from Grain Producers South Australia (GPSA) and the Agricultural Biotechnology Council of Australia (ABCA).

About Mecardo

Mecardo is the leading multi-commodity analysis and risk management advisory enterprise in Australia, covering all major agricultural industries.

Mecardo have one of the largest agricultural price datasets in Australia, however converting this data into meaningful analysis requires an underlying understanding of the industry. This is delivered through the diversity of the Mecardo team, with multifaceted skillsets developed through experience in a wide range of sectors and industries, which sets us apart from our competitors in the agriculture industry. This provides Mecardo with an ability to provide robust analysis crossing commodity boundaries, as opposed to single commodity views.

Agricultural commodities are extremely complex, with a myriad of influences having an impact on market performance. The Mecardo ethos is to distil complex market analysis into a comprehensible and interpretable format.

Across the agriculture sector Mecardo is recognised as possessing the required skills, industry understanding and experience to provide research outcomes, advice, strategy and recommendations based on underlying analytical market evidence and backed by ground truthing consultations.

This report has been produced to be easily understood by all stakeholders within and outside the agricultural and agribusiness industry.

Consultants

The Mecardo business prides itself on being a diverse and capable business which has carefully selected its employees to have complimentary skillsets.

Robert Herrmann



Robert Herrmann is the Managing Director of Mecardo. The company was established as Agconcepts by Robert Herrmann in Adelaide in 1996. Robert has a longstanding background in the wool and sheep industry in Australia.

- Cert 4, Workplace Training and Assessment
- RG146 Derivatives

Matt Dalglish



Prior to joining Mecardo, Matt began his career in 1993 with ANZ Bank as a technical analyst for foreign currency and interest rate markets. Matt progressed onto the currency trading desk, both in Australia and London.

- BA Economics and Finance (RMIT)
- Diploma of Education (Monash)

Andrew Whitelaw



Andrew started his agricultural career in the United Kingdom in the feed and biofuel industry. Andrew has been involved in the trading of various agricultural commodities including Cert-ID NON-GM soymeal, organic wheat and conventional varieties.

- BSc Business IT and eBusiness (West Scotland)
- MA Agribusiness (UQ)
- RG146 Derivatives
- Chartered Quality Institute—ISO:9001 Certified Lead Auditor

Olivia Agar



Olivia completed a Bachelor of Science in Agriculture Degree (Hons) at the University of Sydney in 2014, specialising in Agronomy. In 2017 Olivia joined the Mecardo team, further developing her skillset in data analysis and client consultancy.

- BSc Science in Agriculture (Sydney)

About the project

This report has been commissioned to provide a data driven analysis of the presumed trade and marketing premiums achieved by farmers through the South Australian moratorium on the commercial cultivation of genetically modified (GM) crops.

The SA Greens' MLC Mark Parnell recently claimed that:

The current moratorium has provided a significant price premium for our state's farmers compared to other states.¹

The SA Primary Industries Minister, Leon Bignell commented on premiums in 2014:

Anecdotally, we know there are producers here in South Australia who are getting a premium for their GM-free produce. I have spoken to Viterro and grain producers.²

It is important to provide stakeholders with data driven evidence to ensure that government decisions are not made by anecdotes, but by facts.

This report will not examine the agronomic nor regulatory aspects of the cultivation of GM crops, as this is outside the terms of reference. However, the authors note the following findings made by the Productivity Commission, in the 2017 report *Regulation of Australian Agriculture*:

There is no economic or health and safety justification for banning approved genetically modified (GM) organisms.

- *The Office of the Gene Technology Regulator (OGTR) and Food Standards Australia New Zealand (FSANZ) assess GM organisms and foods for their effect on health, safety and the environment. Scientific evidence indicates that GM organisms and foods approved by the OGTR and FSANZ are no less safe than their non-GM counterparts.*
- *The successful coexistence of GM and non-GM crops is possible and has been demonstrated both in Australia and overseas. This means that if there are any market access or trade benefits (including price premiums for non-GM products), they would be achieved regardless of whether GM crops are in the market.*

1 Source: markparnell.org.au/mr.php?mr=1079

2 Source: www.abc.net.au/news/2017-07-29/sa-growers-challenge-gentically-modified-food-ban-jay-weatherill/8748398

Project aim

The Weatherill Labor government in South Australia have identified that the continuation of the moratorium on the cultivation of GM crops provides a premium to farmers.

The purpose of this paper is to identify the existence and extent of the premiums achieved in South Australia. The methodology is to analyse on a 'like for like' basis, agricultural commodity prices in South Australia against comparable markets in states where the cultivation of GM crops is permissible.

Project scope

The scope of this project is limited to analysing the price premiums received by South Australian farmers.

The report does not consider any agronomic factors involved in the selection of GM crops, nor the traded price of consumer foods.

Commodity selection

To ensure a thorough examination of the presumed premiums available to food and fibre producers in South Australia, we have chosen a set of commodities based on the value to the South Australian economy, which have a high degree of pricing transparency available.

The commodities selected are detailed in Table 1, and comprise 63% of the South Australian agricultural economy.

Table 1: Value of South Australian Broadacre Commodities

Commodity	Gross value	Percentage of overall
Wheat	927,247,960	15%
Barley	365,584,539	6%
Canola	111,863,194	2%
Wool	447,542,321	7%
Sheep and lamb	534,546,618	9%
Cattle	682,665,753	11%
Pork	326,582,263	5%
Grapes	536,482,844	9%
Total	3,932,515,492	63%

Source:ABS

Background

To provide a foundation of knowledge, a synopsis of the background of a number of important factors relating to the cultivation of GM crops has been included in the following sections.

These sections will provide a summary of the following:

- GM regulation and the role of the Gene Technology Regulator
- An overview of crop production in South Australia
- The adoption of GM canola in Australia on a state-by-state basis
- An overview of Australian canola exports on a state-by-state basis
- An overview of co-existence in states cultivating both GM and non-GM crops.

GM regulation

Agriculture is a key driver of the Australian economy, and it is of great importance to ensure the continued high integrity of our produce. Australia has one of the most stringent regulatory regimes coordinating the management and introduction of genetically modified crops. The Gene Technology Regulator, assisted by the Office of the Gene Technology Regulator (OGTR) is responsible for the identification and management of risks posed by live and viable genetically modified organisms (GMOs), including GM crops.

The OGTR carries out risk analysis to identify and manage any risks posed to human health and the environment by new GM crops before allowing field trials and before seeds can be commercially produced and sold to farmers.

The OGTR prepares a risk assessment and risk management plan before granting a licence for commercial release of new GM crops. This includes:

- identifying if a new characteristic of a GM crop may cause harm, compared to its conventional counterpart
- developing risk management plans, on a case-by-case basis, to ensure that any identified risks (if any) can be managed
- asking for both expert and public feedback on the risk assessment and management plan on both ethical as well as technical issues.

These stringent controls are in place to ensure that new GM crops are thoroughly scrutinised, to ensure any risks to human health and the environment have been identified and can be managed.

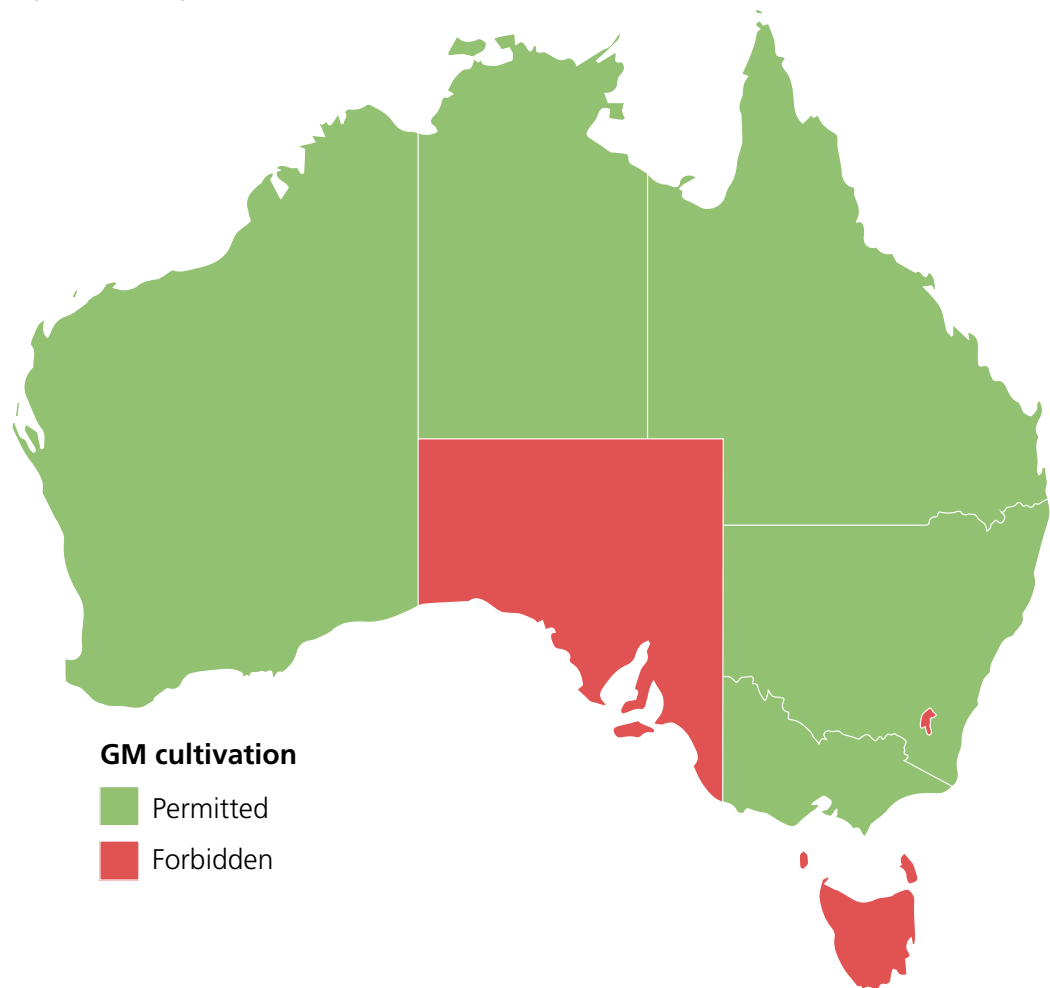
In 2003, the OGTR issued licences for the commercial release of two types of GM Canola in Australia. All state and territory governments, except Queensland and the Northern Territory subsequently established GMO-free zones to delay the release of GM canola until trade and marketing considerations had been addressed. New South Wales, Victoria and Western Australia now allow the commercial production of GM canola.

The moratoria in South Australia and Tasmania have been identified by the Productivity Commission (PC), as a regulation reducing flexibility and constraining the use of more efficient production techniques.

The PC highlight limited evidence of the moratoria providing substantive premiums, and the capacity for co-existence between GM crops and non-GM crops. Successful co-existence has been proven throughout Australia and overseas.

The only regions in Australia which have maintained moratoria on the commercial cultivation of GM crops, are South Australia, Australian Capital Territory and Tasmania (see Map 1).

Map 1: GM crop status (Australia)



Crop production in South Australia

Crop production is the largest single contributor to the South Australian agricultural economy. The production of wheat, barley and canola contribute \$1.4 billion annually to the South Australian economy, or 23% of all agricultural income.

In South Australia, wheat makes up the bulk of crop grown, at on average 56% of the area allocated to cultivating broadacre crops. This is followed by barley at 23%, and canola at 6% (Figure 1).

In South Australia, the bulk of the crop is exported due to the limited domestic demand. However, during periods of production deficit in eastern Australia the South Australian supply can be utilised by the domestic market. At present the majority of grain and oilseed production is exported through the bulk handling system operated by Viterra. In recent years, small scale export pathways have emerged, and future port infrastructure projects are expected on the Eyre Peninsula.

The canola crop in South Australia, is predominantly the focus of any debate relating to the adoption of GM crops, as any removal of the GM moratorium will likely result in the cultivation of GM Canola. The area devoted to canola in Australia has increased dramatically since the turn of the century (Figure 2).

In Table 2, a comparison is provided of the average area for the first five years of the century, versus the average of the past five years. It is interesting to note that of the major canola producers, South Australia has demonstrated the least growth between the two periods at 27%.

Figure 1: Planting area as a percentage of total broadacre crop area in South Australia

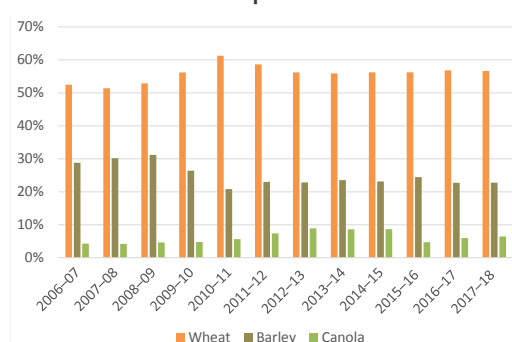


Figure 2: Total are of canola planting in each state (Ha)

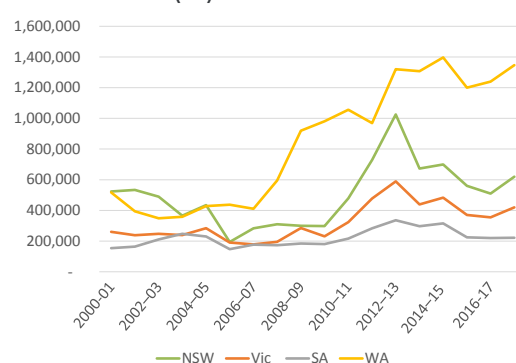


Table 2: Growth in canola area (Ha)

State	2000–05	2013–17	Change
NSW	469,356	612,394	30%
Vic	254,084	413,534	63%
Qld	846	1,434	70%
SA	201,044	256,051	27%
WA	409,272	1,298,169	217%
Tas	469	1,026	119%
Total	1,335,070	2,582,606	93%

Adoption of GM canola in Australia

The cultivation of GM crops is a voluntary activity, and farmers in countries and regions where GM cultivation is permitted will make their own decision on utilising GM production techniques. It is therefore appropriate to examine the adoption of GM crops in Australia.

The adoption of GM canola in Australia has been swift, with the strongest growth recorded in Western Australia.

In Figure 3, we can see overall percentage of canola crops planted to GM varieties in Australia. The overall canola crop comprises 19% of area. When South Australia is excluded, due to the lack of access the GM canola area increases to 21% of eligible canola cultivation.

In Figure 4, highlights the percentage of canola sown as GM varieties for NSW, Vic and WA. The most substantial growth in GM cultivation has occurred in Western Australia, with approximately 28% of the states canola planted as GM in 2017. In Vic and NSW, the growth has not been as strong however it remains a popular crop choice, at 14%, and 11% respectively.

Independent research from Brookes and Barfoot (2017)³ indicates an average net increase in gross margins for Australian GM canola in 2015 of US\$37/ha.

The grower is ultimately the decision maker when determining which crops to plant on their property. The decision will be elected by many reasons including both economic and agronomic judgements.

In the case of the majority of the GM canola varieties currently commercially available, the economic decision is not solely based on one year's performance. There are residual benefits which flow onto subsequent years through improved field health.

Figure 3: Percentage of canola sown as GM varieties

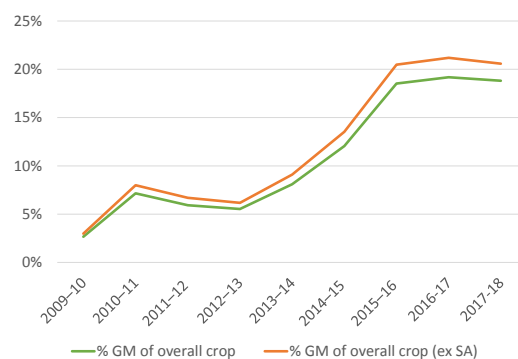
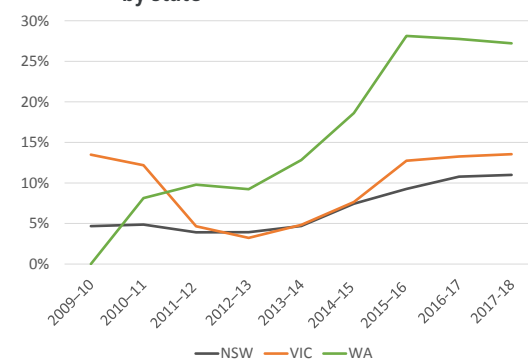


Figure 4: Overall percentage of canola crops planted to GM varieties in Australia by state



³ Brookes G and Barfoot P 2017, *The Global Socio-Economic and Environmental Impact of GM Crops: 1995 to 2015*, PG Economics Ltd Dorchester.

Canola exports

The South Australian Government have publicly signalled that the GM moratorium allows the state to protect the canola trade. To give an indication of the countries that South Australia has traded canola in recent years, and whether this is true, we have examined the flows of canola in the past three years (Table 3).

The canola flow data does not indicate the GM or non-GM status of the canola. Interestingly, there are no export destinations with whom South Australia has traded canola with, that the neighbouring states (which permit GM canola cultivation) have not also traded.

In addition, South Australia has not exported any canola into France or Germany, which are countries that currently prohibit commercial GM cultivation.

The trade of canola from Western Australia, which is the largest producer of GM canola, into the same export destinations as South Australia points to evidence of the capacity for bulk handlers to effectively segregate between conventional (non-GM) and GM varieties.

Table 3: Canola flows

Country	NSW	SA	Vic	WA
Netherlands	60,000	216,754	30,000	881,992
Belgium	60,000	181,465	180,000	679,445
Argentina	-	81,816	90,000	331,582
South Africa	167,550	61,834	155,482	228,265
United Arab Emirates	-	57,470	-	75,727
Japan	-	53,865	5,249	279,121
China	-	49,850	-	296,476
France	80,000		100,862	614,613
Germany	99,839	-	-	550,491
Hong Kong	-	-	-	50,000
Indonesia	-	-	-	5,000
Oman	-	-	-	16,000
Pakistan	-	-	30,377	122,061
Portugal	-	-	-	54,999
Singapore	-	-	66,714	-
South Korea	-	-	-	25,000
Spain	65,000	-	113,000	411,530
Sri Lanka	60,000	-	-	-
Taiwan	-	-	-	50,000
United States	-	-	10,000	120,169

Source: Reuters Eikon

Co-existence

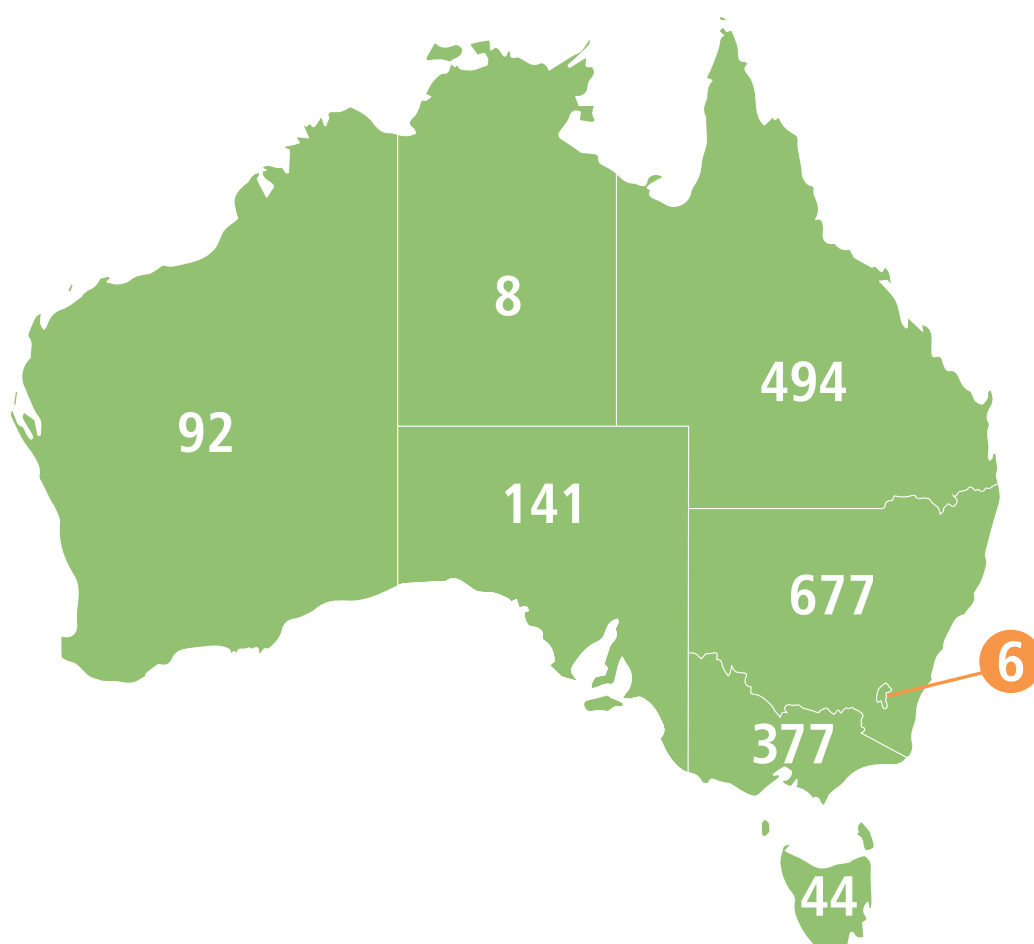
In Australia, the co-existence between non-GM and GM canola, can be considered effective. At present there have been few, if any, issues relating to seed incursions between crops, and with modern bulk handling systems segregation of stocks has been effective.

There are concerns from organic certified businesses, relating to issues around the unintended presence of GM material on their land or in their products. This concern is often used to justify the continued GM moratorium in South Australia.

It is important to note however, that within Australia there are a considerable number of states that hold high levels of organic certifications, co-existing with GM cultivation.

At present, Queensland, New South Wales and Victoria, all have a higher number of organic certifications than South Australia, and all permit the commercial cultivation of GM crops. It is possible to extrapolate on this basis, that the cultivation of GM crops in South Australia could operate effectively alongside the organic food production industry, as is the case in other states.

Map 2: Organic Farms (Australian Certified Organic)



Pricing analysis

Wheat

In South Australia, wheat is the most important agricultural commodity, providing 15% of the state's agricultural income and comprising 56% of the states cropping area in the past decade.

Due to its importance to the South Australian economy, it is extremely important to understand whether a repeal of the GM moratorium would impact upon the prices received by farmers. If there are substantial premiums available in South Australia, as result of its status as a GM-free state, then it should be clear when compared to other GM growing states.

Methodology

To produce an analysis of wheat prices, it is important to choose comparable markets. In our analysis of the premium achieved in South Australia because of the GM moratorium we have elected to compare Adelaide with Geelong (Victoria) and Kwinana (Western Australia).

The wheat crop in South Australia is typically destined for the export market, however occasionally there will be demand into Victoria. It is therefore appropriate to study the differential between South Australia and a domestic and export state which both produce GM crops. The wheat crop, is not one homogeneous product, and is made up of various grades. The grade which we have selected for analysis is APW (Australian Prime Wheat), which is the base grade used by the grain trade.

The wheat market is driven by both global and domestic factors, with prices rising and falling largely due to supply issues. The port zones in Australia all tend to correlate closely with one another. When two markets have a high degree of correlation, this means that they have a strong relationship with one another. In effect, this shows that when a price falls/rises in one zone, it will be repeated in others.

In Figure 5 and Figure 6, the correlation of Geelong/Kwinana and Adelaide wheat at port is displayed. The data shown is the daily price from 1 January 2012 to present. The charts clearly display an interdependence upon one another. The Geelong port has a correlation of 0.92, and Kwinana 0.85, with 1 being a perfect correlation and 0 being no correlation.

Figure 5: Correlation of Geelong and Adelaide wheat price at port

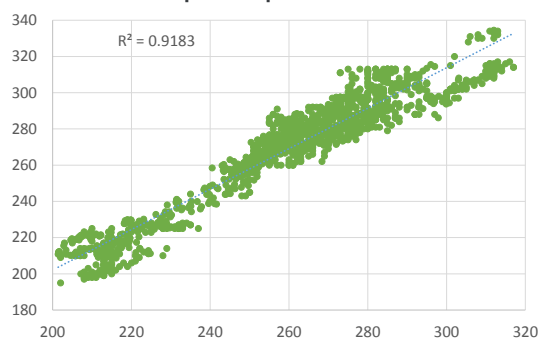
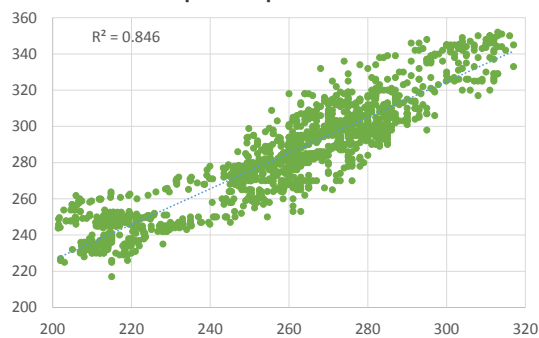


Figure 6: Correlation of Kwinana and Adelaide wheat price at port



Results

In Figure 7 the comparison of the APW price available to growers at the Geelong and Adelaide port zones. The price at both ports tend to follow one another closely, however as can be clearly determined, the Geelong price trades more often at levels above the Adelaide port.

In Figure 8, the comparison of the APW price at the Kwinana and Adelaide port is studied. As expected, the ports both follow similar patterns, however again Kwinana tends to trade more often at a premium to Adelaide.

Figure 7: APW price at Geelong and Adelaide port zones

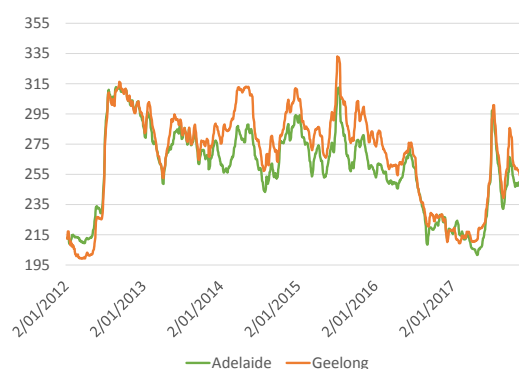
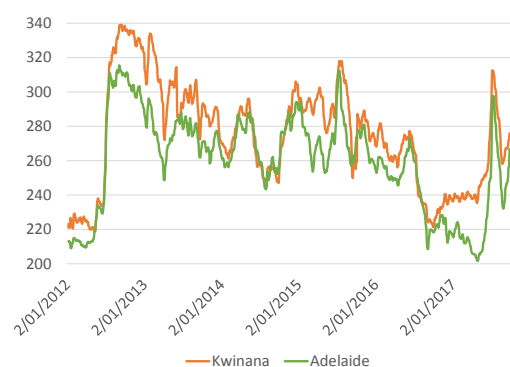


Figure 8: APW price at Kwinana and Adelaide port zones



To give a clearer vision of the comparison of Adelaide and Geelong/Kwinana, the below charts have been produced. In Figure 9, the percentage premium or discount between Adelaide and Geelong is displayed. Any pricing below 0% signifies a discount in Adelaide versus Geelong. On average since 2012 Adelaide has traded at a 3% discount to Geelong.

In Figure 10, the comparison of Adelaide and Kwinana is displayed, in a similar pattern the majority of the time farmers delivering into Adelaide are receiving a discount to Kwinana, at an average of 5%.

Interestingly, the orange lines on both these charts represent the linear trajectory, and in both comparisons the discount in Adelaide has been steadily increasing. This highlights that wheat in South Australia is in fact reducing in value against two states which are growing GM crops, contradicting the argument for an increasing premium for South Australia wheat due to the GM moratorium.

Figure 9: Percentage premium or discount in APW price to Adelaide from Geelong



Figure 10: Percentage premium or discount in APW price to Adelaide from Kwinana



Barley

In South Australia, the barley crop comprises 25% of the broadacre cropping industry in South Australia for the past decade, and contributes 6% of the overall agricultural income for the state.

The barley grown in South Australia is used for both feed consumption, and in the domestic and international malt market.

Methodology

To produce an analysis of barley prices, it is important to choose comparable markets. In our analysis of the presumed premium achieved in South Australia because of the GM moratorium we have elected to compare Adelaide with Geelong (Victoria) and Kwinana (Western Australia).

The barley crop in South Australia is used in both the domestic and export markets. It is therefore appropriate to study the differential between South Australia and a domestic and export state which both produce GM crops.

There are a multitude of different barley varieties which have been developed for both the feed market and the malt market. The bulk of the barley crop produced is for the feed market, and even malting barley can become feed grade, due to downgrading based on seasonal conditions. It is therefore appropriate to examine the feed price, which for the case of this study will be the F1 grade.

The port zones in Australia all tend to correlate closely with one another. When two markets have a high degree of correlation, this means that they have a strong relationship with one another. In effect, this shows that when a price falls/rises in one zone, it will be repeated in others.

In Figure 11 and Figure 12, the correlation of Geelong/Kwinana and Adelaide F1 barley at port is displayed. The data shown is the daily price from 1 January 2012 to present. The charts clearly display an interdependence upon one another. The Geelong port has a correlation of 0.89, and Kwinana 0.91, with 1 being a perfect correlation and 0 being no correlation.

Figure 11: Correlation of Adelaide and Geelong F1 barley prices at port

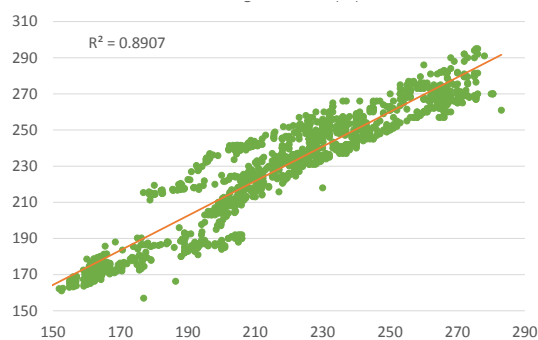
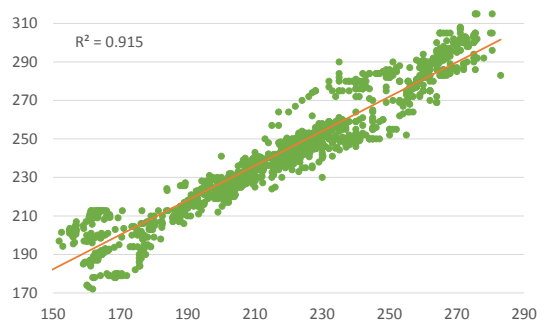


Figure 12: Correlation of Adelaide and Kwinana F1 barley prices at port



Results

In Figure 13 the comparison of the F1 barley price available to growers at the Geelong and Adelaide port zones. The price at both ports tend to follow one another closely, however as can be clearly determined, the Geelong price trades more often at levels above the Adelaide port.

Figure 13: F1 barley price to growers at Adelaide and Geelong port zones

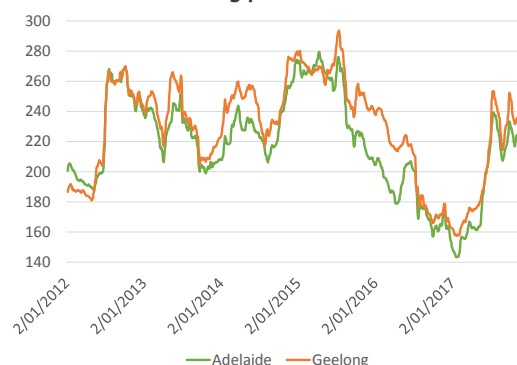
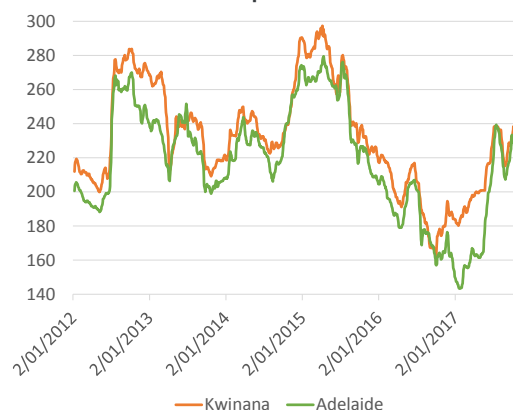


Figure 14: F1 barley price to growers at Adelaide and Kwinana port zones



In Figure 14, the comparison of the F1 barley price at the Kwinana and Adelaide port is studied. In a similar manner to the Geelong and Adelaide comparison, Kwinana trades more often at a premium to Adelaide.

To give a clearer vision of the comparison of Adelaide and Geelong/Kwinana, the below charts have been produced. In Figure 15, the percentage premium or discount between Adelaide and Geelong is displayed. Any pricing below 0% signifies a discount in Adelaide versus Geelong. On average since 2012 Adelaide has traded at a 5% discount to Geelong.

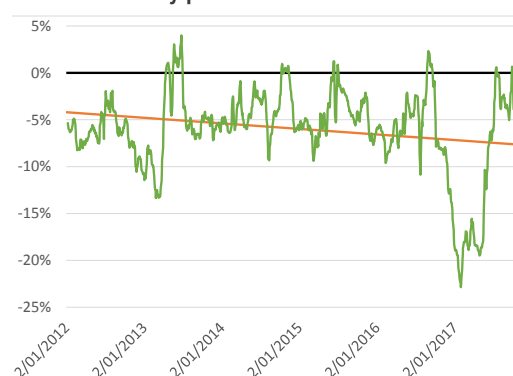
In Figure 16, the comparison of Adelaide and Kwinana is displayed, in a similar pattern most of the time farmers delivering into Adelaide are receiving a discount to Kwinana, at an average of 7%.

Interestingly, the orange lines on both these charts represent the linear trajectory, and in both comparisons the discount in Adelaide has been steadily increasing. This highlights that barley in South Australia is in fact reducing in value against two states which are growing GM crops, contradicting the argument for an increasing premium for South Australian barley due to the GM moratorium.

Figure 15: Percentage premium or discount in F1 Barley price to Adelaide from Geelong



Figure 16: Percentage premium or discount in F1 Barley price to Adelaide from Kwinana



Canola

Canola comprises 6% of the broadacre cropping industry in South Australia over the past decade, and contributes 2% of the overall agricultural income for the state.

The canola crop is the key commodity when it comes to the moratorium, as it will be the primary GM product grown in SA in the event of a repeal of the GM moratorium.

Methodology—Greens South Australia

The Hon. M.C. Parnell, in his private members bill to the South Australian Parliament,⁴ provided evidence of a premium achieved by South Australian growers as a direct result of the moratorium. This is the only instance of evidence presented of a premium being provided to South Australian farming businesses.

It is therefore important to discuss the methodology used by the Hon. M.C. Parnell as it was highly inconsistent with commonly used analytical procedures. The evidence provided was a comparison of the spread between Non-GM and GM canola in several states on the week commencing 9 October 2017.

There are two major flaws in this methodology:

- Comparing the discount between non-GM and GM in another state is not an analogous comparison to South Australian canola pricing.
- When comparing pricing, it is important to choose an appropriate time period, one week is not considered a long enough period for a robust analysis. This is especially important in agricultural commodities which can be volatile due to weather conditions causing supply constraints.

Methodology

In order to compare analyse comparable markets, we have elected to compare South Australia with Western Australia and Victoria. These are both states which cultivate GM canola, and the assumption from the Weatherill Labor government and the Greens SA party are that premiums would be visible.

In South Australia, the majority of canola is exported in a similar fashion to Western Australia, giving a more comparable relationship between the two. There are however times when South Australian canola will flow into the domestic markets in Victoria, therefore a comparison between these two states will be included.

The most logical pricing point to analyse, is a comparison of the price of non-GM in Adelaide, with non-GM in other states growing GM crops.

The Australian canola market is driven by both global and domestic factors, with prices rising and falling largely due to supply issues. The port zones in Australia all tend to correlate closely with one another. When two markets have a high degree of correlation, this means that they have a strong relationship with one another. In effect, this shows that when a price falls in one, it will also fall in another.

⁴ Genetically Modified Crops Management Regulations (Postponement of Expiry) Bill, SA Hansard, 18 October 2017.

In Figure 17 and Figure 18, the correlation of Geelong/Kwinana and Adelaide canola at port is displayed. The data shown is the daily price from 1 January 2012 to present. The charts clearly display an interdependence upon one another. The Geelong port has a correlation of 0.91, and Kwinana 0.82, with 1 being a perfect correlation and 0 being no correlation.

Figure 17: Correlation of Adelaide and Geelong Canola prices at port

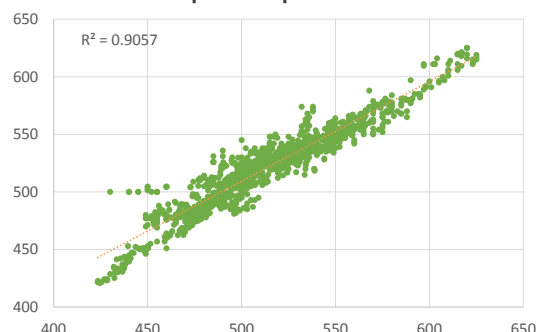
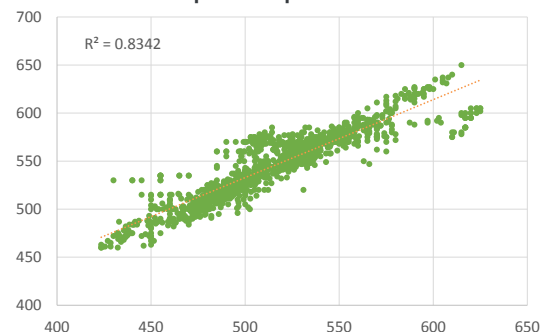


Figure 18: Correlation of Adelaide and Kwinana Canola prices at port



Results

In Figure 19, a comparison of the grower price of non-GM canola in Adelaide (Green) and Geelong (orange) is displayed. They both follow closely, however Geelong is more often trading at a premium to Adelaide.

Figure 20, is the comparison of non-GM canola in Adelaide and Kwinana. The Kwinana port cost has been adapted to consider the intake fees, which are paid by the grower in order to give a like for like comparison.

Figure 19: Canola price to growers at Adelaide and Geelong port zones



Figure 20: Canola price to growers at Adelaide and Kwinana port zones



To give a clearer vision of the comparison of Adelaide and Geelong/Kwinana, the below charts have been produced. In Figure 21, the percentage premium or discount between Adelaide and Geelong is displayed. Any pricing below 0% signifies a discount in Adelaide versus Geelong. On average since 2012 Adelaide has traded at a 2% discount to Geelong.

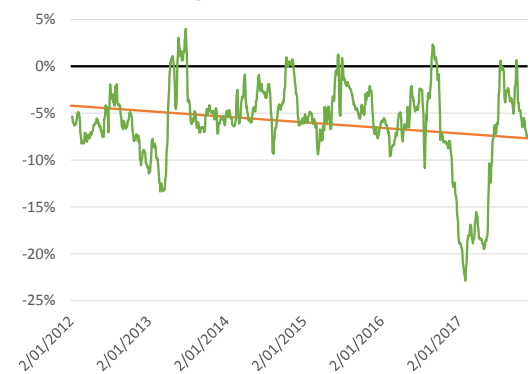
In Figure 22, the comparison of Adelaide and Kwinana is displayed. In a similar pattern, the majority of the time farmers delivering into Adelaide are receiving a discount to Kwinana, at an average of 3%.

Interestingly, the orange lines on both these charts represent the linear trajectory, and in both comparisons the discount in Adelaide has been steadily increasing. This highlights that canola in South Australia is in fact reducing in value against two states which are growing GM crops, contradicting the argument for a premium to South Australian canola farmers due to the GM moratorium.

Figure 21: Percentage premium or discount in Canola price to Adelaide from Geelong



Figure 22: Percentage premium or discount in Canola price to Adelaide from Kwinana



Wool

The wool market is worth an estimated 7% to the South Australian agricultural economy. The wool produced in South Australia is typically sold at auction in Melbourne. The price received at auction for wool is based on several quality factors including micron levels and vegetable.

Due to the nature of South Australian wool being sold at auction in Melbourne, and no sales originating in South Australia, there is no data on pricing at a state-by-state level.

We have however spoken with a number of prominent industry professionals who provided the following insights:

There is no differentiation for wool based on its proximity to the cultivation of GM crops. The main factors are the micron, length and strength of the combined samples. We have seen increased interest in the "providence" of wool, with customers interested in the origin of the sheep producing the fibre. To date, this has been contained to factors relating to animal husbandry, land management etc.

Andrew Woods, Wool Analyst, Independent Commodity Services, December 2017

Wool is traded internationally in the world fibre market, with blending on many types to produce the ideal yarn and fabric. Factors such as softness, style and character are subjective assessments used by exporters alongside the more robust measured traits of micron, fibre strength and length, vegetable matter and yield. There is no evidence to date that the wool market rewards or indeed seeks any information relating to the GM status.

Michael De Kleuver, Wool Broker, Rodwells December, 2017

Cattle

To determine if a premium exists for South Australian cattle producers we need to be able to compare markets that are interdependent and share a degree of correlation in price movement to ensure that we are measuring like for like.

We have run a series of correlation analysis over historic cattle price movements contrasting SA to other states and a variety of cattle categories. Results of the analysis indicate a strong correlation on an annual basis when comparing Victorian Trade Steer price movements to SA Trade Steer price movements.

Methodology

Price differences between Victorian Trade Steers and SA Trade Steers were converted to both annual and monthly logarithmic returns and a correlation analysis was run on these returns to measure the Pearson correlation coefficient (r^2).

Price variations are converted to logarithmic returns because correlation measurements are used more appropriately when the underlying distributions satisfy certain properties—such as being normally distributed and when the data is non-stationary. Logarithmic returns are preferred to simple returns as these are more normally distributed than simple returns.

The main reason that returns are used to measure correlation instead of nominal prices is because prices are 'non-stationary'. This means that they have trends. One requirement for practically all statistics functions (including correlation) is that the data is 'stationary' otherwise the results are overstated by the trend following nature of prices.

The result of calculating price returns over a designated timeframe are considered stationary and can therefore be used to provide a much more appropriate measure of price interdependence between periods. The formula used to calculate the monthly and annual returns is outlined below:

Return = $\log_{10} (\text{Price } T / \text{Price } T+1)$ where T denotes the time period, i.e. monthly or annual.

Percentage spread analysis was undertaken between the monthly average prices of Victorian Trade Steers and SA Trade Steers by calculating the percentage variation between the two-price series expressed as a percentage. The formula for calculating the percentage spread was as follows:

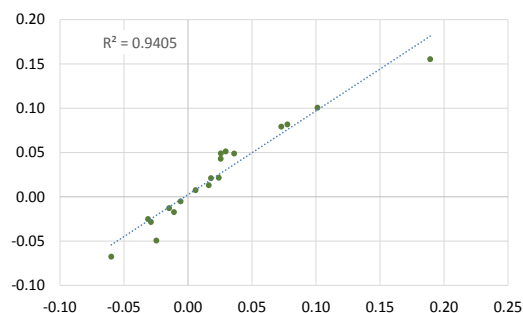
Percentage Spread = $((\text{Monthly Average Price of Vic Trade Steer} / \text{Monthly Average Price of SA Trade Steer}) - 1) \times 100$

Results

On an annual basis, the returns correlation between SA and Victorian Trade Steers shows a very strong interdependence, scoring an r^2 of 0.9405 (Figure 23). This means that nearly all of the time the annual price movement in SA Trade Steers and Victorian Trade Steers follow each other.

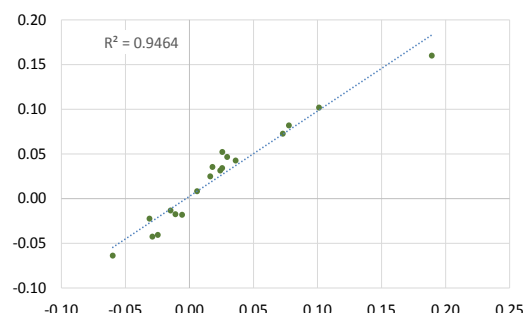
Analysis of the monthly returns between SA and Victorian Trade Steers shows a moderate correlation with an r^2 of 0.4165 (Figure 24), which suggests that over a monthly timeframe prices between the two states can deviate according to local supply and demand conditions but, as the annual correlation highlights, will move back in line over the longer term as arbitrage opportunities and competitive pressures bring the two markets back into balance.

Figure 23: Annual Returns Correlation Vic to SA trade steer



Source: MLA's NLRS, ACA

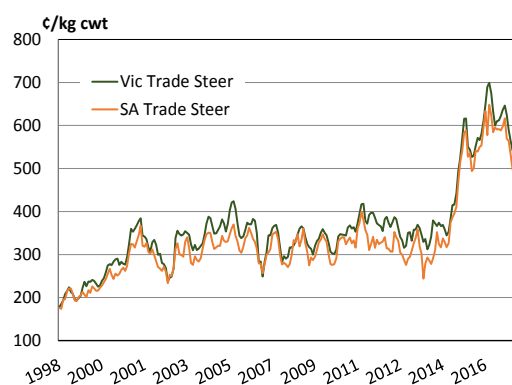
Figure 24: Monthly Returns Correlation Vic to SA trade steer



Source: MLA's NLRS, ACA

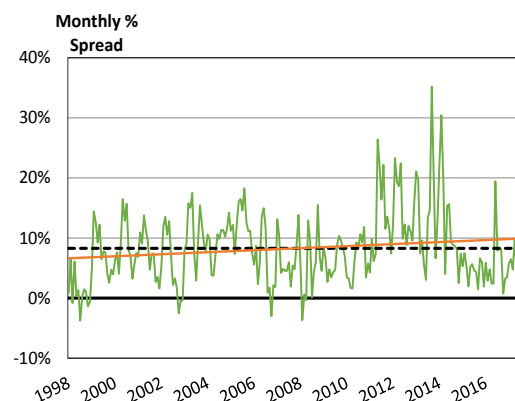
Figure 24 highlights the average monthly price achieved by SA and Victorian Trade Steer producers at the saleyard according to the weekly MLA reported statistics. A cursory glance at the chart illustrates two fairly obvious characteristics of the two price patterns; namely, that the prices of SA and Victorian Trade Steers share a close interdependence and that SA prices usually run at a discount to Victorian prices.

Figure 25: Monthly average price Vic to SA trade steer



Source: MLA's NLRS, ACA

Figure 26: Monthly average spread Vic to SA trade steer



Source: MLA's NLRS, ACA

An overview of the historic percentage spread between SA and Victorian Trade Steer monthly average prices from 1998 to 2017, as outlined in Figure 25, demonstrates how few times SA producers have enjoyed a premium over their Victorian counterparts. Indeed, there have only been four brief periods over the last two decades when SA Trade Steers achieved a premium over Victorian Trade Steers on a monthly basis.

Analysis of the monthly spread data (Figure 26) shows that Victorian Trade Steers have posted a long run average premium of 8.3% over SA Trade Steers (black dotted line) and the orange spread trendline shows that over the last two decades the premium spread in favour of Victoria has been expanding, as denoted by the upward slope to the trendline.

As highlighted above, the spread for Victorian to SA Trade Steers from 1998 to 2017 sits at 8.3% premium. However, measuring the average spread from 2008 to 2017, shows that the premium spread has widened to 9.1% in favour of Victorian cattle producers.

Sheepmeat

The two most highly correlated markets for South Australian Trade Lamb and South Australian Mutton are their Victorian counterparts, so this is the most appropriate place to begin an investigation into the proposition that the non-GM status of South Australia affords a price premium being obtained by SA producers, over the long term, when compared to their Victorian cousins.

Methodology

As was the case with the cattle price analysis, the methodology for determining the correlation between markets was to compare the logarithmic returns for SA Trade Lambs and Mutton to Victorian Trade Lambs and Mutton, over a monthly basis.

The percentage spread analysis was also conducted using weekly price data of the Trade Lambs and Mutton according to the following formulae:

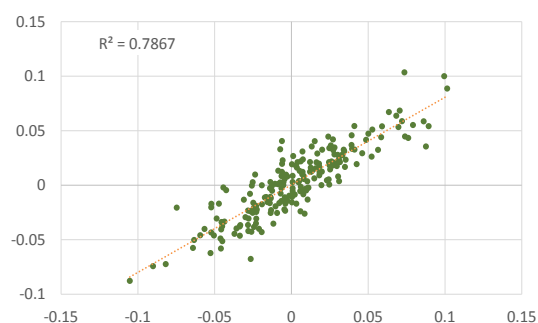
Percentage Spread Trade Lamb = $((\text{Weekly Average Price of Vic Trade Lamb} / \text{Weekly Average Price of SA Trade Lamb}) - 1) \times 100$

Percentage Spread Mutton = $((\text{Weekly Average Price of Vic Mutton} / \text{Weekly Average Price of SA Mutton}) - 1) \times 100$

Results

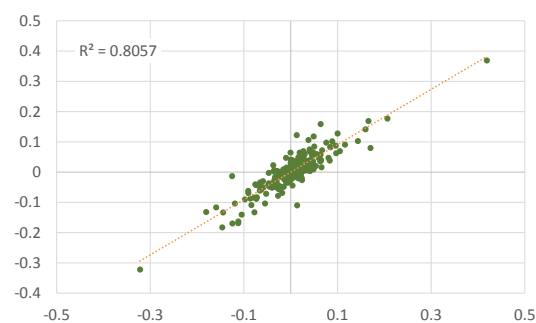
Figure 27 and Figure 28 highlight that on an average, monthly basis price changes between both SA Trade Lamb and Mutton share a very strong correlation with Victoria with Trade Lambs scoring an r^2 of 0.7867 and Mutton posting an even higher r^2 of 0.8057, both indicative of a strong price interdependence between these respective markets.

Figure 27: Monthly returns correlation Vic to SA trade lamb



Source: MLA's NLRS, ACA

Figure 28: Monthly returns correlation Vic to SA mutton

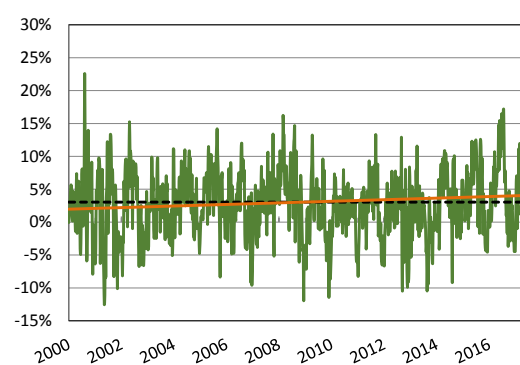


Source: MLA's NLRS, ACA

Analysis of the Trade Lamb spread since 2000 shows that over the long term Victorian producers have been enjoying a 3% price premium, as highlighted by the black dotted line in Figure 29. Interestingly, in recent times the spread has widened in favour of Victorian Trade Lamb producers, such that the recent price premiums have been closer to 4%, as indicated by the upward sloping spread trend line, displayed in orange.

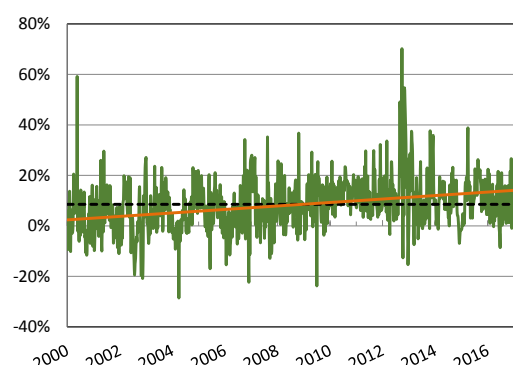
Similarly, the long term historic spread pattern for mutton shows a price advantage to Victorian producers over SA too. Indeed, the average premium is even more pronounced at 9% since 2000 — dotted black line as per Figure 30. As was the case with Trade Lambs, the spread for Mutton has been widening in favour of Victorian Mutton producers such that in more recent years the spread has moved toward a 10% premium.

Figure 29: Monthly average spread Vic to SA trade lamb



Source: MLA's NLRS, ACA

Figure 30: Monthly average spread Vic to SA mutton



Source: MLA's NLRS, ACA

Pork

The pork industry contributes 5% of the agricultural economy in South Australia. According to ABS statistics,⁵ there are 209 businesses with pigs, which in 2015–16 equated to 408,468 pigs, or 18% of the national herd.

In this analysis, a comparison of premiums and discounts between South Australia and Victoria has been chosen. These states operate largely in the same domestic market, and therefore a comparison is appropriate.

Methodology

In order to give a representation of the final pork price paid to pig producers in South Australia, we have elected to compare two pricing points. The 60–75kg and 75–85kg carcass weight price, these are the weight ranges that pigs are typically sold.

In Figure 31 and Figure 32, the correlation of pork pricing between South Australia and Victoria is displayed. In Figure 31, the 60–75kg carcass weight is shown, and in Figure 32 on a weekly price basis. These charts show a clear interdependence, with the 60–75kg weight range having a correlation of 0.9663, and 75–85kg at 0.9613. A correlation of 1 is a perfect correlation, whilst 0 would indicate no correlation.

Figure 31: Correlation of 60–75kg carcass weight pork price between SA and Vic

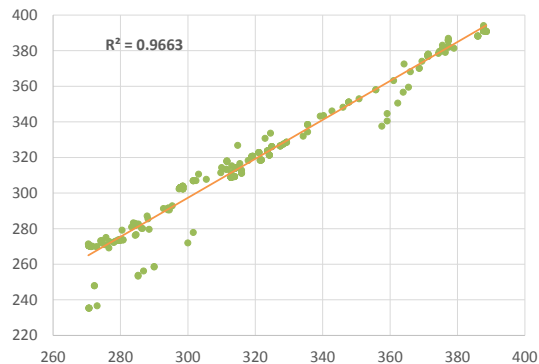
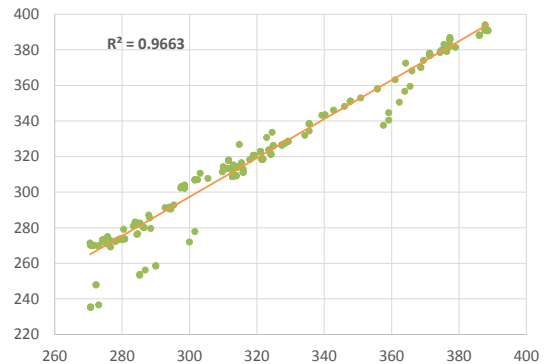


Figure 32: Correlation of 75–85kg carcass weight pork price between SA and Vic



⁵ ABS, Agricultural Commodities, Australia, 2015–16

Results

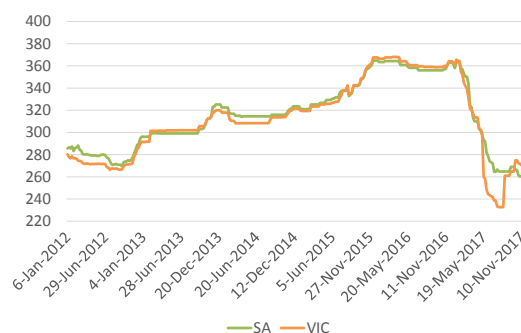
In Figure 33, the pig price in South Australia and Victoria is displayed for 60–75kg carcass weight animals, Figure 34 displays the same comparison however with the 75–85kg carcass. As we can see the two states typically tend to trade at very similar levels. Since 2012, both Victoria and South Australia have held premiums over one another. Interestingly, from May 2017 through to August 2017, a substantial premium was achieved in South Australia.

This period of time coincides with a period, when producers in Victoria were being turned away by abattoirs.⁶ However, prices have since reverted back to more typical levels.

Figure 33: 60–75kg carcass weight pig price in SA and Vic



Figure 34: 75–85kg carcass weight pig price in SA and Vic



To give a clearer indication of the premium/discount between South Australia and Victoria, Figure 35 and Figure 36 have been produced. These display the premium or discount as a percentage, the substantial premium in 2017 is clearly apparent, and could be considered anomalous.

The pork price in South Australia for 60–75kg carcass weight pigs since 2012 has averaged a premium of 0.46%, when the 2017 anomalous period is excluded this drops to -0.13%.

The pork price in South Australia for 75–85kg carcass weight pigs since 2012 has averaged a premium of 1.08%, when the 2017 anomalous period is excluded this drops to 0.5%.

Overall this points to the pork market in South Australia and Victoria trading at very similar levels, with a somewhat limited premium in South Australia, dependent upon carcass weight.

Figure 35: 60–75kg carcass weight pork price percentage premium or discount to SA from Vic

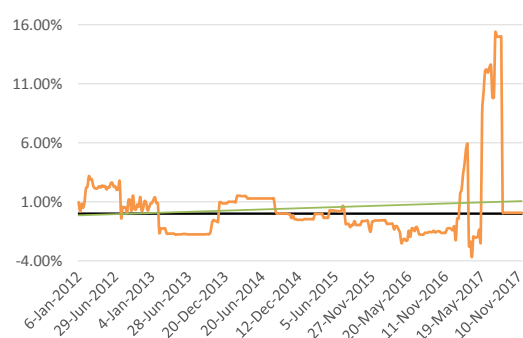
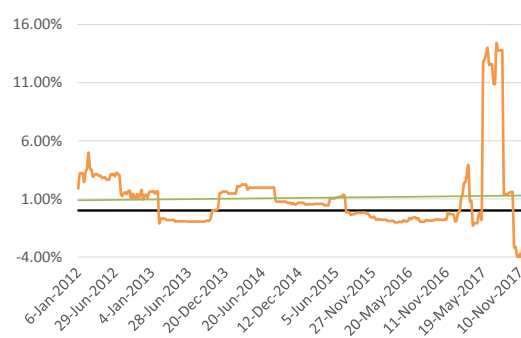


Figure 36: 75–85kg carcass weight pork price percentage premium or discount to SA from Vic



⁶ www.weeklytimesnow.com.au/agribusiness/pig-cull-warning-falling-pork-prices-may-force-producers-to-destroy-pigs/news-story/7e191c146167ef785cfad761a15d7e65

Wine grapes

Grape production has become an important agriculture product in both domestic and export markets. The industry has a global reputation for high quality wines which has subsequently contributed to growth in the secondary output of agritourism.

The total estimated value of the Australian winegrape crush in 2016 was \$1.08 billion. Of which, South Australia contributed 51% of the tonnes crushed (Wine Australia). This amounted to a farmgate value of \$581 million to South Australian growers in 2015–16 (SA Scorecard).

Wine grape prices have been on an upward trend since 2011. The average national purchase price across all varieties was \$565 per tonne in 2017.

South Australia has 23 distinct wine regions. The Lower Murray, Fleurieu, Limestone Coast and Barossa Valley regions contribute the greatest value to the state through grape production.

Methodology

To compare the local price received for grape production in South Australia with other states and the Murray Darling–Swan Hill (MDSW) district the calculated average purchase value per tonne by region and variety was used. This data was summarised for the period of 2008–17 and provided by Wine Australia.⁷ To ensure like for like analysis, any varieties not grown in South Australia were not included in the calculations. To indicate whether SA growers on average received premiums or discounts for their grapes by comparison, the average spread of \$/tonne between SA and each state and MDSW was calculated each year.⁸

The percentage discount of average local price between SA and Vic, and SA and WA from 2008 to 2017 was calculated and plotted in Figure 37. Victoria was selected based on its proximity and similar market to South Australia, while Western Australia was selected because it is the largest producer of GM Canola and hence should in theory reflect any market and trade advantages or disadvantages due to GM use most.

Further analysis was conducted to compare the markets at a regional level. The regions of Riverland (SA), Riverina (NSW) and Murray Darling–Swan Hill (Vic and NSW) were selected as comparable markets under advice from Wine Australia. The average \$/tonne price of three varieties of wine in the distinct regions was calculated and plotted in Figure 39.

⁷ Any variety/region combination that did not have at least three separate batches purchased was not included in the data provided by Wine Australia.

⁸ Queensland has been excluded from the analysis due to insufficient volumes.

Results

On average, South Australia grapes are priced at a discount to Tasmania, Victoria and Western Australia. The only state which South Australia receives a premium to is New South Wales and the Murray Darling–Swan Hill district.

Figure 37: Difference between average \$/tonne price in South Australia and various states and districts

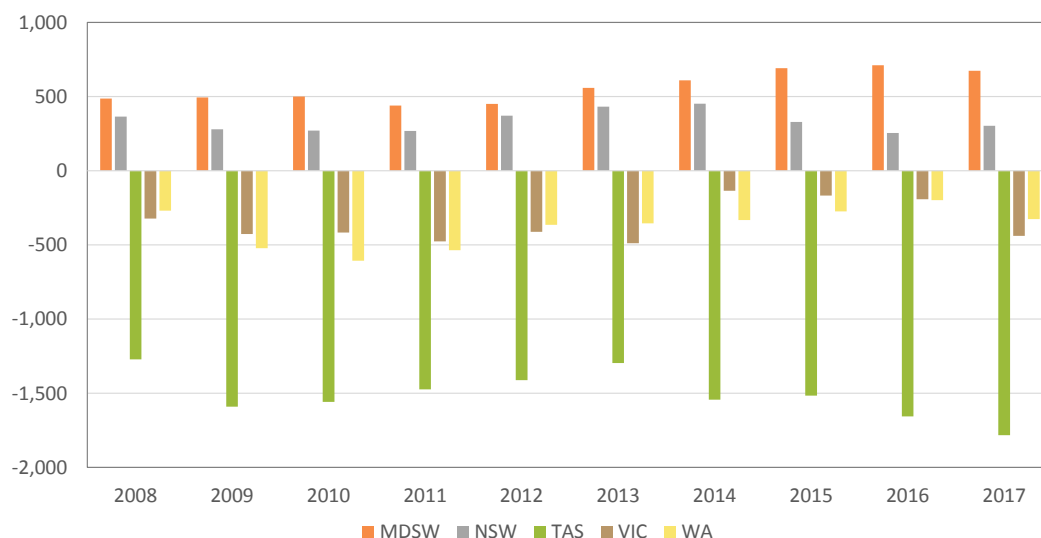
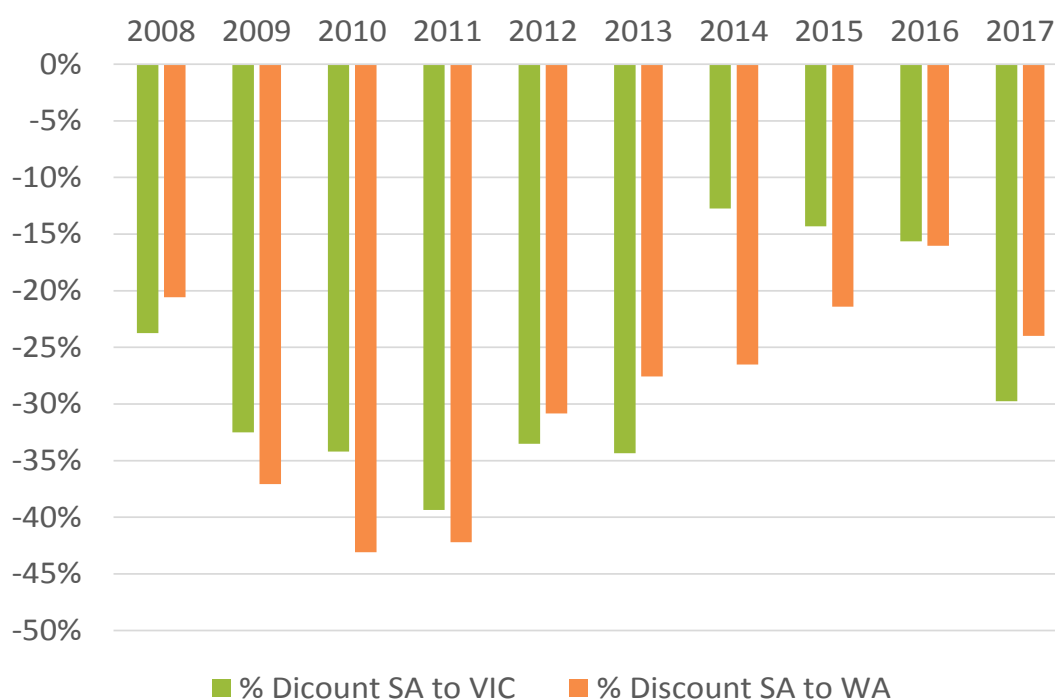


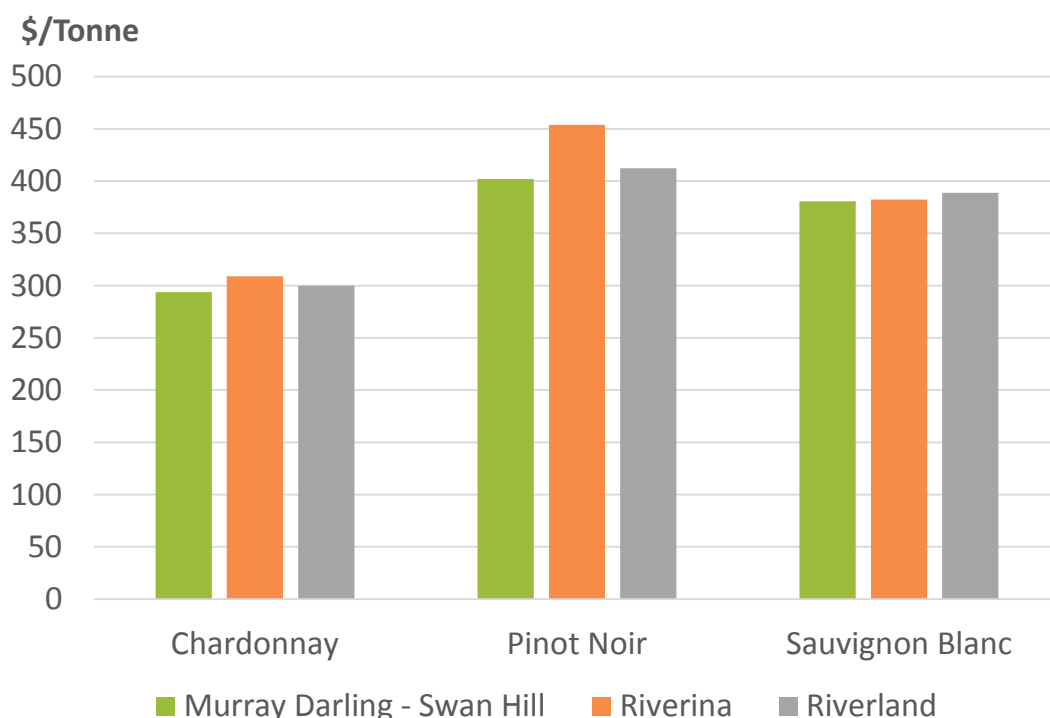
Figure 38 shows that since 2008 South Australia has continuously received a discounted local price for wine grapes on a \$/tonne basis. The discount was largest in 2010–11 and the spread began to narrow over the years. The discount SA received to Victoria has again been rising since 2014 to an estimated 30% discount in 2017. While it is only in the last two years that the spread to Western Australia has been growing.

Figure 38: Average percentage price discount received by South Australian growers, to Victoria and Western Australia



It is worthwhile noting that despite Western Australia being Australia's largest GM canola growing state, this does not correlate with lower prices for wine grapes.

Figure 39: \$/tonne average price for 2008–17 for select varieties and regions



Analysis of the \$/tonne price of grapes at a variety and region level showed that the premiums and discounts to specific regions changed seasonally for all three varieties. For example, Riverland (SA) received a premium price for Sauvignon in 2010–12 and again in 2015, but was at a discount to Riverina and/or Murray Darling–Swan Hill in all other years between 2008–17. Over the total period, Riverland received an average premium for Sauvignon of \$6 to the Riverina and \$8 to MDSW. For Pinot Noir it received an average discount of \$42 to Riverina and premium of \$10 to MDSW. For Chardonnay, Riverland received a discount of \$9 to Riverina and discount of \$6 to MDSW. These variability in price, and hence premiums or discounts between years, varieties and regions indicates the wide range of factors that determine price.

The following statement was provided by Wine Australia, which highlights the lack of concern for GM crops being cultivated in proximity to vineyards.

Winegrapes are not traded as a homogeneous commodity and the \$/tonne price received by grape growers is determined by a wide variety of factors. The location of the vineyard and quality of the grapes are significant determinants of price, while other factors such as distance to the winery and contract arrangements can also have an influence. It is the view of the industry analysts at Wine Australia that a region or state's status as 'GM-free' would be unlikely to have an effect on grape price and therefore would not be expected to play a role in premiums or discounts to any states.

December, 2017

Conclusion

The intended purpose of this report was to provide an in-depth analysis of price premiums achieved by primary producers in South Australia.

The moratorium on commercial GM crop production has been extended until 2025, based on presumed premiums being achieved by farmers. This project was commissioned in response to public assertions that South Australian farmers were receiving substantive premiums because of the GM moratorium.

This analysis examined commodities which contribute 63% of the South Australian agricultural economy. The thorough pricing analysis in this report, outlined that the GM moratorium has not resulted in substantive premiums, or a trade and marketing advantage for the majority of primary producers in South Australia.

The only commodity displaying a premium is pork, albeit very a slight one. It is not possible to determine whether this premium is because of the GM moratorium; however, industry stakeholders have pointed towards logistical issues in 2017 creating a short-term and isolated trade imbalance.

The premiums and discounts available to South Australian primary producers are in the opinion of our researchers linked to logistics, and proximity to market as opposed to the presumed benefits of the GM moratorium.

When commodity prices are compared on a like for like basis with analogous regions, using stringent analytical methodology, the evidence of price premiums or a trade and marketing advantage as a proposition for the continuation of the GM moratorium is insufficient.

