Australian Government
Department of Agriculture, Water and the Environment
ABARES

Weekly Australian Climate, Water and Agricultural Update

No. 20/2021

27 May 2021

Summary of key issues

- During the week ending 26 May 2021, blocking high pressure systems resulted in little rainfall being recorded across much of Australia. However, low pressure troughs and cold fronts generated moderate rainfall across isolated parts of western, southern and eastern Australia (see Section 1.1).
- These falls across southern cropping regions will benefit the establishment of dry sown winter crops and encourage addition planting activity. Further rainfall will be needed to support crop growth and benefit yields, particularly in South Australia and parts of Victoria where soil moisture is low.
- Oceanic and atmospheric indicators show that the El Niño-Southern Oscillation (ENSO) remains neutral and is unlikely to have much influence on Australia's climate in the short-term. The combination of a neutral ENSO and a neutral Indian Ocean Dipole (IOD) suggest that changes in the Southern Annular Mode (SAM) are likely to drive climatic conditions in Australia during winter (see Section 1.2).
- There is a 50% chance of recording average or close to average June to August rainfall totals across most winter cropping regions. This forecast coupled with average to above average soil moisture levels in New South Wales, and parts of Queensland and Western Australia, is likely to provide ideal conditions for growth of winter crops. If this forecast is realised, close to average winter rainfall in Victoria and South Australia is likely to be sufficient to support the germination and establishment of winter crops in those areas that have yet to record an autumn break (see Section 1.3).
- Over the next eight days, showers and storms are expected across parts of Western Australia and Tasmania, while high-pressure systems are expected to keep rainfall to a minimum across the majority of central and south-eastern Australia.
- In Australia's cropping regions, rainfall totals of between 10 and 50 millimetres are forecast for Western Australia. Rainfall totals of between 5 and 10 millimetres are forecast for isolated parts of western South Australian cropping regions. The falls across Western Australian cropping regions will likely benefit the establishment and growth of early sown winter crops and encourage farmers to finalise planting programs (see Section 1.4).
- Water storage in the Murray–Darling Basin (MDB) increased by 213 gigalitres (GL) between 18 May 2021 and 25 May 2021. The current volume of water held in storage is 14,558 GL, which represents 58% of total capacity. This is 47% or 4,655 GL more than at the same time last year.
- Allocation prices in the Victorian Murray below the Barmah Choke increased from $97 per ML on 14 May 2021 to $121 per ML on 21 May 2021. Trade is open from the Murrumbidgee, with prices increasing during the week.

1. Climate

1.1. Rainfall this week

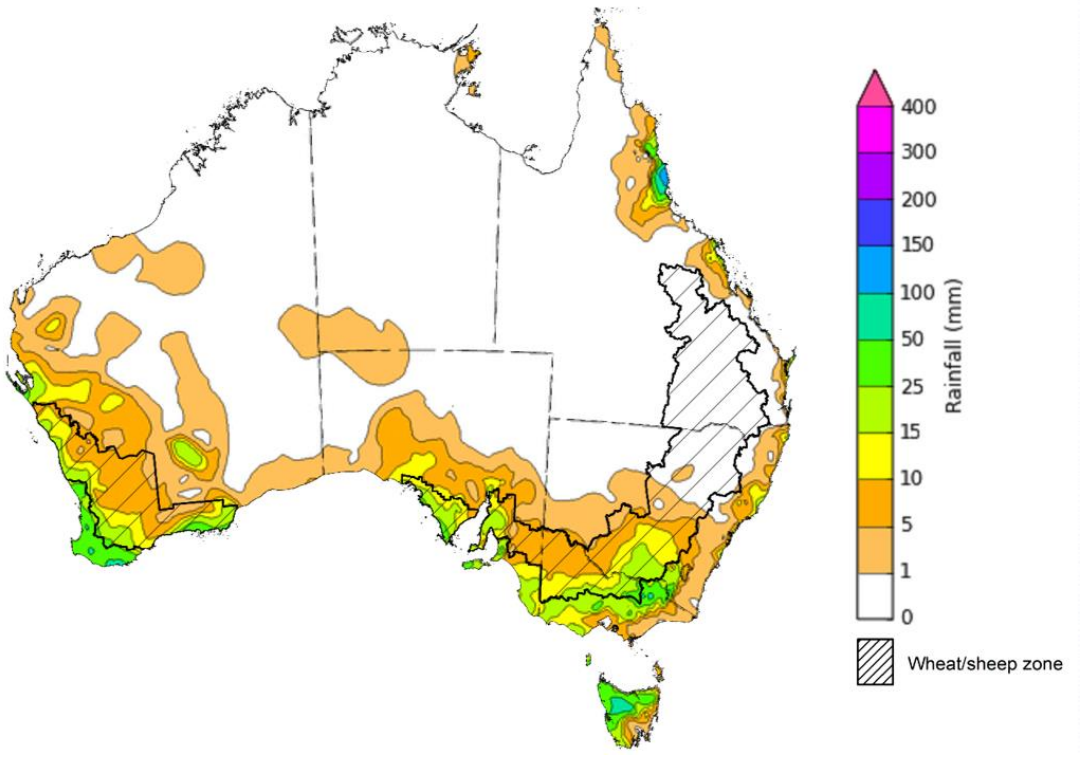
During the week ending 26 May 2021, blocking high pressure systems resulted in little rainfall being recorded across much of Australia. However, low pressure troughs and cold fronts generated moderate rainfall across isolated parts of western, southern and eastern Australia.

Rainfall totals of between 5 and 50 millimetres were recorded across parts of southern New South Wales, north-eastern Queensland, southern and central Victoria, southern South Australia, south-western Western Australia, and Tasmania. Rainfall totals in excess of 50 millimetres were recorded across isolated parts of north-eastern Queensland, eastern Victoria, south-western Western Australia and north-western Tasmania.

In cropping regions, rainfall totals of between 5 and 25 millimetres was recorded across parts of southern New South Wales and much of Victoria, South Australia and Western Australia. Rainfall totals in excess of 25 millimetres was recorded across isolated parts of south-eastern Victoria, western South Australia and southern Western Australian cropping regions. Little to no rainfall was recorded across cropping regions in northern New South Wales and Queensland during the week ending 26 May 2021.

These falls across southern cropping regions will benefit the establishment of dry sown winter crops and encourage addition planting activity. Further rainfall will be needed to support crop growth and benefit yields, particularly in South Australia and parts of Victoria where soil moisture is low.

Rainfall for the week ending 26 May 2021



 Issued: 26/05/2021

Note: The rainfall analyses and associated maps utilise data contained in the Bureau of Meteorology climate database, the Australian Data Archive for Meteorology (ADAM). The analyses are initially produced automatically from real-time data with limited quality control. They are intended to provide a general overview of rainfall across Australia as quickly as possible after the observations are received. For further information go to http://www.bom.gov.au/climate/rainfall/

1.2. Climate Drivers

Throughout winter the climate drivers with the largest potential impact on Australia's climate patterns are the El Niño–Southern Oscillation (ENSO), the Indian Ocean Dipole (IOD) and the Southern Annular Mode (SAM). These climate drivers will likely influence the outlook for Australia's winter cropping season.

Analysis of oceanic and atmospheric indicators suggest that ENSO conditions remain neutral, reducing its influence on Australia's climate patterns. Analysis of sea surface temperatures in tropical Indian Ocean indicate that the IOD is also currently neutral.

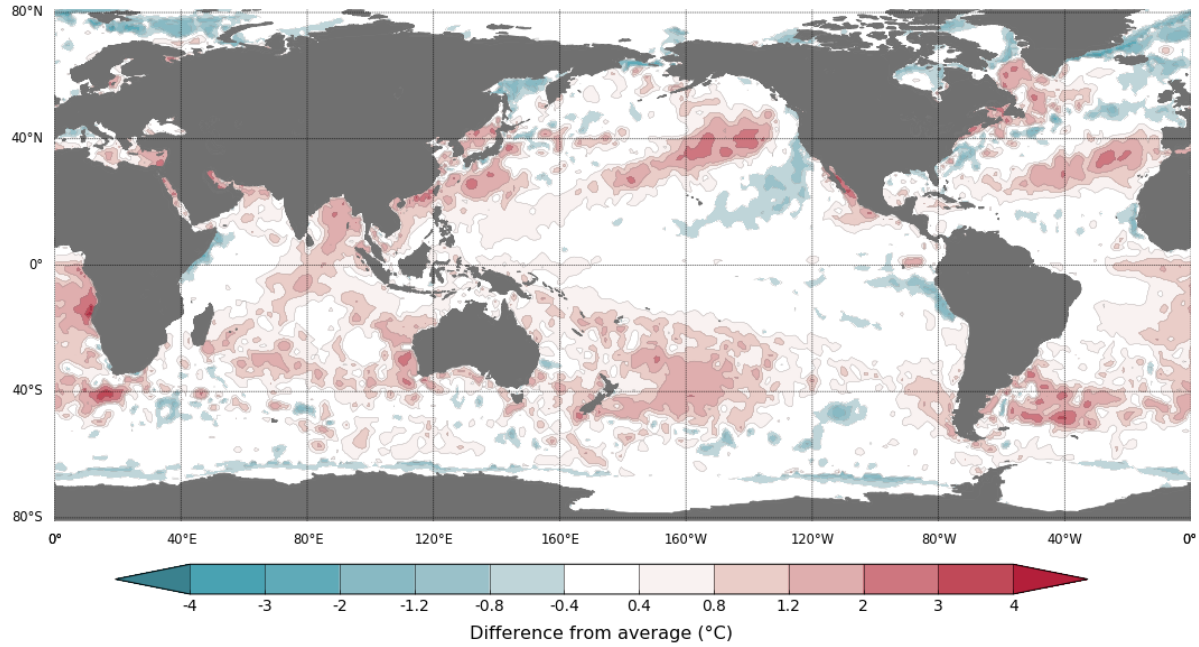
A neutral ENSO and IOD means these climate drivers are unlikely to have much influence over Australia's climate over the short-term. If neutral ENSO and neutral IOD conditions persist into winter, the SAM will likely be the main influence on winter rainfall.

The SAM is currently negative and is expected to remain negative for the next week then increase towards neutral over the following week. At this time of year negative SAM can enhance rainfall over south-west Western Australia and south-eastern Australia, and reduce rainfall for western parts of the coastline of the Great Australian Bight, New South Wales, and southern Queensland.

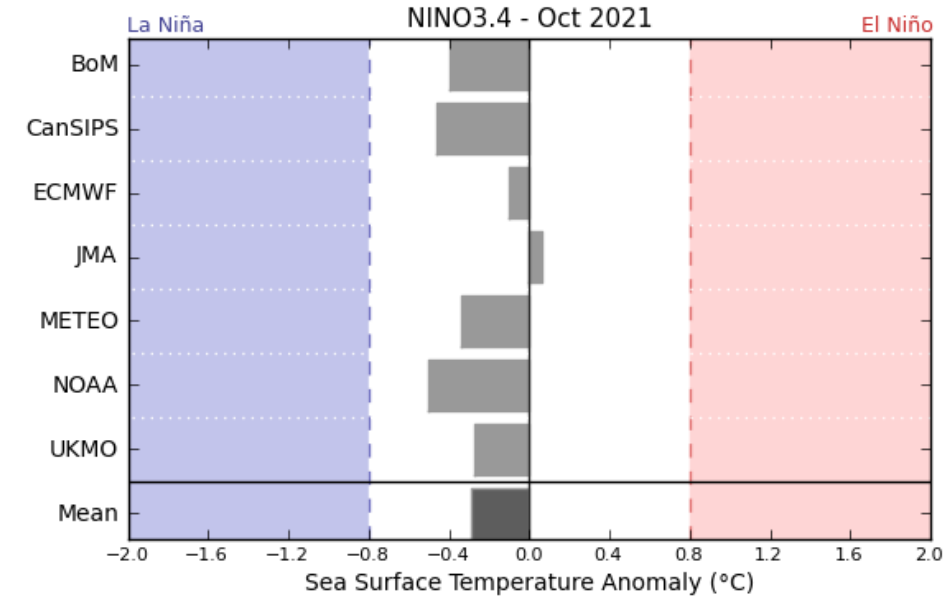
Over the past weeks, sea surface temperature anomalies have been close to average across the tropical Pacific Ocean. This return to long-term average sea surface temperatures is associated with the return to a neutral ENSO. As of 25 May 2021, all of the international climate models surveyed predict sea surface temperatures in the tropical Pacific to remain neutral until at least October.

Sea surface temperatures near Western Australia, the south and east coast of Australia and Indonesia remain above average. The warm temperature anomalies in the southern and eastern Indian Ocean have remained largely unchanged over the past couple of weeks, while warm anomalies in the north-eastern Indian Ocean have strengthened. Warm anomalies in the eastern Indian Ocean and the ocean surrounding Australia are associated with increased rainfall across parts of Australia.

Difference from average sea surface temperature observations 17 May to 23 May 2021



International climate model outlooks for the NINO 3.4 region in October 2021



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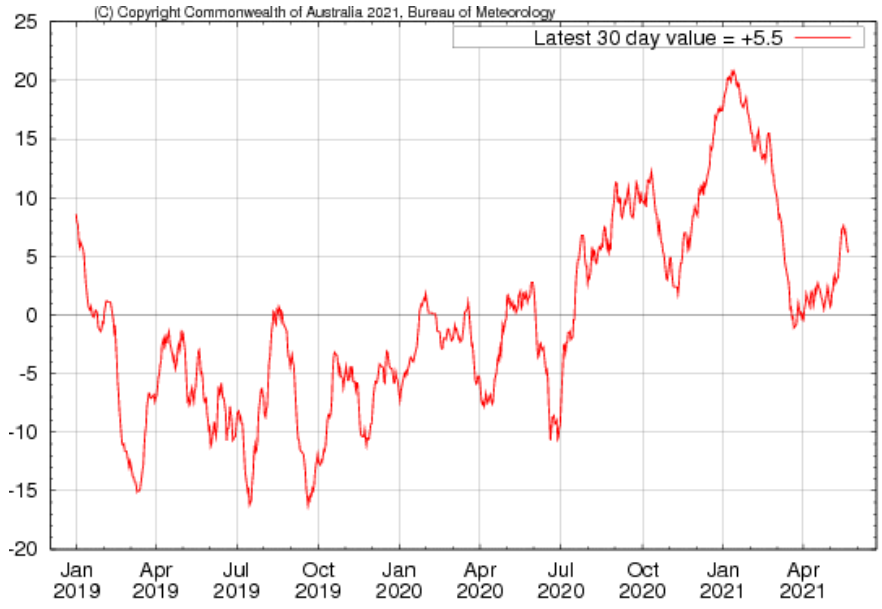
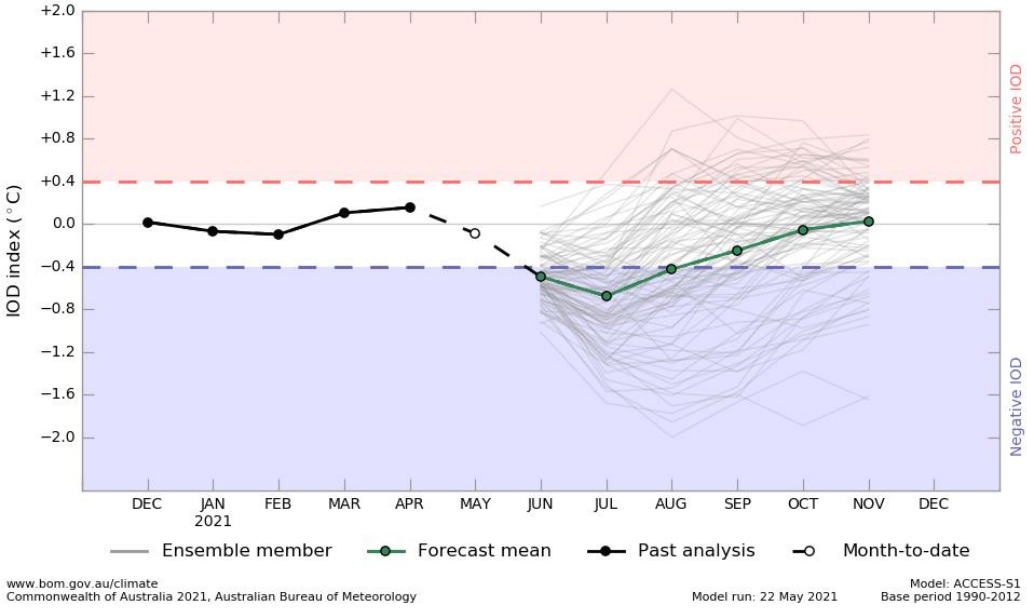
Trade wind strength across the tropical Pacific has remained close to average over the past fortnight. Cloudiness near the Date Line has also remained close to average over the past fortnight. Average trade wind strength and cloudiness near the Date Line are associated with neutral ENSO conditions. The Southern Oscillation Index (SOI) provides an atmospheric measure of the development and intensity of the ENSO by assessing air pressure differences between Tahiti and Darwin. The 30-day SOI for the period ending 23 May was +5.5. For the period ending 23 May, the 90-day SOI value was +1.5. The 30-day and 90-day SOI have stabilised below the La Niña threshold value of +7. Overall, the SOI values indicate a continuation of neutral conditions.

30-day Southern Oscillation Index (SOI) values ending 23 May 2021



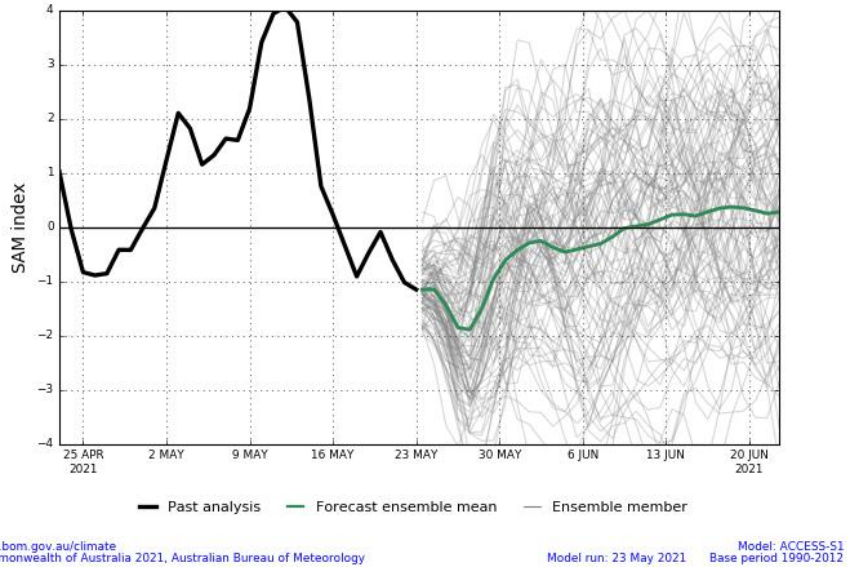
As at 23 May, the Indian Ocean Dipole (IOD) weekly value was -0.46°C, which is weakly negative. For an IOD event to be declared, negative IOD values must be sustained for 8 consecutive weeks. The international climate models surveyed by the Bureau of Meteorology have mixed expectations for the months ahead. One of the five models predict a negative IOD in June (below -0.4°C), while four anticipate the IOD remaining neutral. By September, a different model predicts a negative IOD, while the remaining four anticipate neutral IOD conditions. A positive IOD is associated with lower rainfall and above average temperatures across southern Australia during winter and spring. A negative IOD is associated with above average winter and spring rainfall across southern Australia, as well as the far north. It is also associated with an early northern rainfall onset.

Monthly sea surface temperature anomalies for IOD region



The Southern Annular Mode (SAM) is currently negative and expected to remain negative over the coming week, before returning toward neutral. The SAM refers to the north-south shift of the band of rain-bearing westerly winds and weather systems in the Southern Ocean compared to the usual position. A negative SAM in winter is associated with increased rainfall for northern New South Wales, southern Queensland and southern parts of South Australia and Western Australia. It is also associated with decreased rainfall for much of Victoria, the west of Western Australia and Tasmania.

Southern Annular Mode (SAM) daily index



1.3. National Climate Outlook

These climate outlooks are generated by ACCESS–S (Australian Community Climate Earth-System Simulator–Seasonal). ACCESS–S is the Bureau of Meteorology's dynamical (physics-based) weather and climate model used for monthly, seasonal and longer-lead climate outlooks.

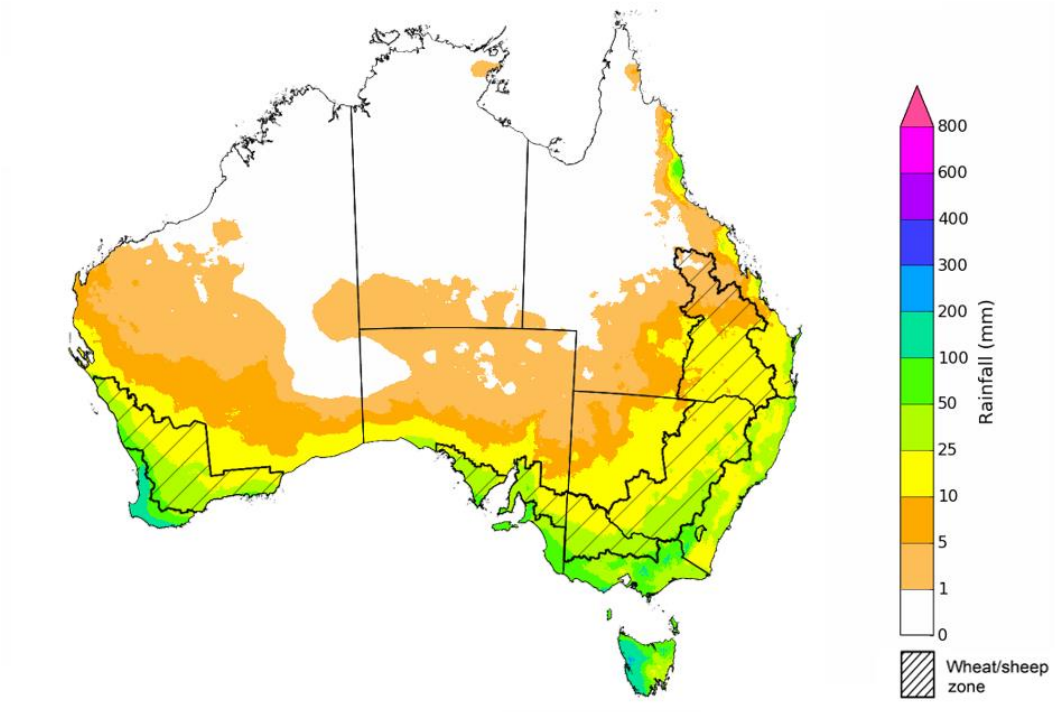
For further information, go to http://www.bom.gov.au/climate/ahead/about/

The Bureau of Meteorology's latest rainfall outlook indicated wetter than average conditions are more likely for parts of north-western, central and eastern Australia during June. It should be noted that May marked the beginning of the northern Australian dry season. This means tropical northern Australia typically has very low rainfall totals at this time of year, and only a small amount of rainfall is needed to exceed the median. In contrast, the wetter than average conditions expected in parts of south-eastern Australia are likely influence the outlook for Australia's winter cropping season.

The outlook for June 2021 indicates that there is a 75% chance of rainfall totals between 10 and 100 millimetres across parts of eastern, south-western and far southern Australia. Rainfall totals in excess of 100 millimetres are expected across parts of Tasmania and isolated parts of south-eastern and south-western Australia.

Across cropping regions there is a 75% chance of rainfall totals of between 5 and 10 millimetres in parts of central Queensland. There is a 75% chance of rainfall totals between 10 and 50 millimetres for New South Wales, southern Queensland, Victoria, South Australia and Western Australia.

Rainfall totals that have a 75% chance of occurring June 2021



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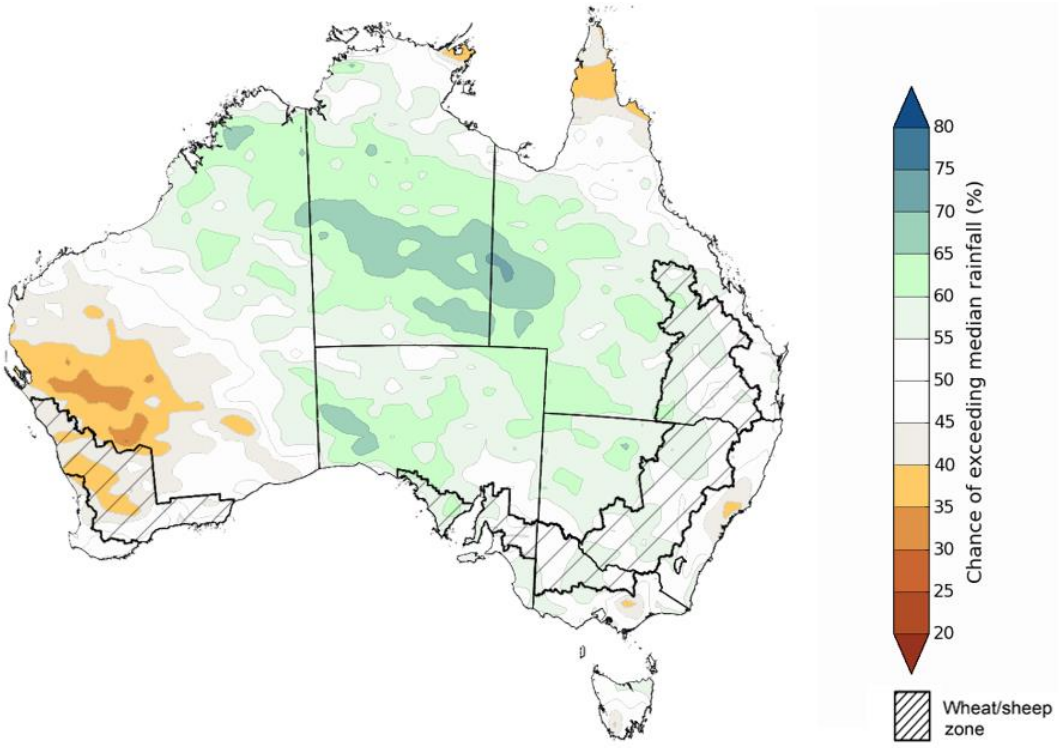
The ACCESS-S climate model suggests there is a 50% chance of recording close to average June rainfall totals across much of Australia, including most cropping regions in New South Wales, central and southern Queensland, Victoria, South Australia and Western Australia. An early autumn break has occurred for much of the New South Wales, southern areas of Queensland, Western Australian and Tasmanian cropping regions. Based on the 50% chance scenario those cropping regions in parts of western Victoria and South Australia that have yet to record an autumn break are forecast to receive between 25 to 50 millimetres of rainfall to support the germination and establishment of winter crops. If realised these forecast rainfall totals for June will provide sufficient moisture for planting of winter crops across most cropping regions.

The rainfall outlook for June to August 2021 suggests there is a greater than 60% chance of above average rainfall across parts of north-western New South Wales, western Queensland, South Australia, eastern Western Australia and much of the Northern Territory. There is a less than 40% chance of exceeding median rainfall across parts of northern Queensland and the west of Western Australia (Bureau of Meteorology 'National Climate Outlook', 20 May 2021).

Bureau of Meteorology rainfall outlooks for June to August have greater than 55% past accuracy across most of central and southern Australia. Outlook accuracy is greater than 65% across parts of northern New South Wales, southern Queensland, the south of the Northern Territory and much of Western Australia. In contrast, there is low past accuracy for parts of western and south-eastern New South Wales, northern Queensland, eastern Victoria, south-eastern South Australia, the north of Western Australia and the north of the Northern Territory. This indicates that for this time of the year the outlook model performs no better than random chance in these areas.

Chance of exceeding the median rainfall June to August 2021



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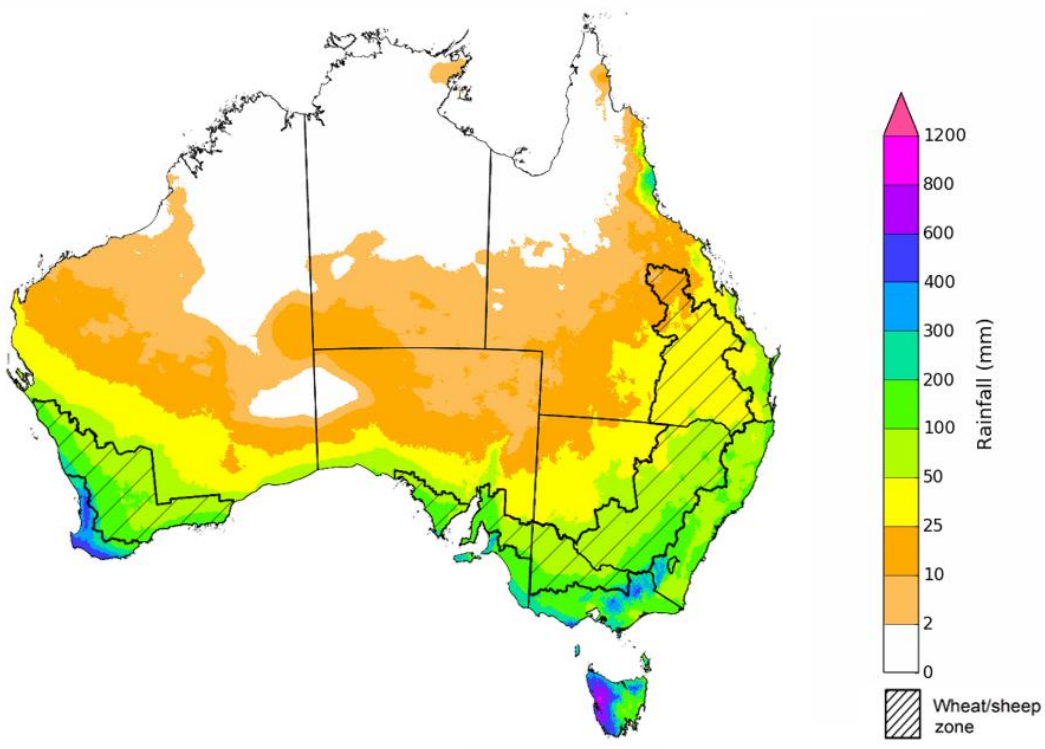
The outlook for June to August suggests there is a 75% chance of rainfall totals between 50 and 200 millimetres across much of New South Wales and Victoria, and parts of far eastern Queensland, the south of Southern Australia, the southwest of Western Australia and eastern Tasmania. Rainfall totals in excess of 300 millimetres are likely across parts of alpine regions of New South Wales and Victoria, and the far south-western Western Australia and northern and western Tasmania.

Across cropping regions, there is a 75% chance of receiving between 50 and 200 millimetres in New South Wales, Victoria, South Australia and Western Australia. Totals of less than 50 millimetres are expected in Queensland cropping regions.

There is a 50% chance of recording average or close to average June to August rainfall totals across most winter cropping regions. Average to above average soil moisture levels in New South Wales, and parts of Queensland and Western Australia are likely to provide good conditions for the establishment and growth of winter crops, while the probability of close to average in-season rainfall will assist with yield development in the coming months.

Rainfall totals that have a 75% chance of occurring June to August 2021



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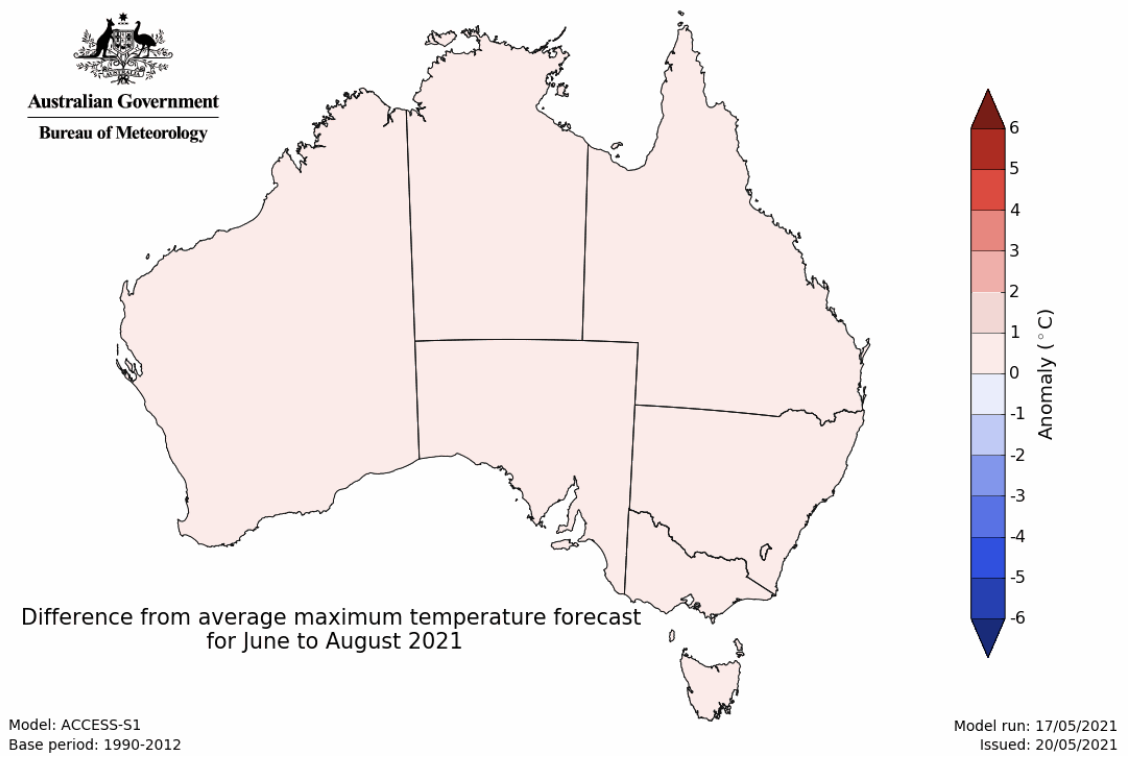
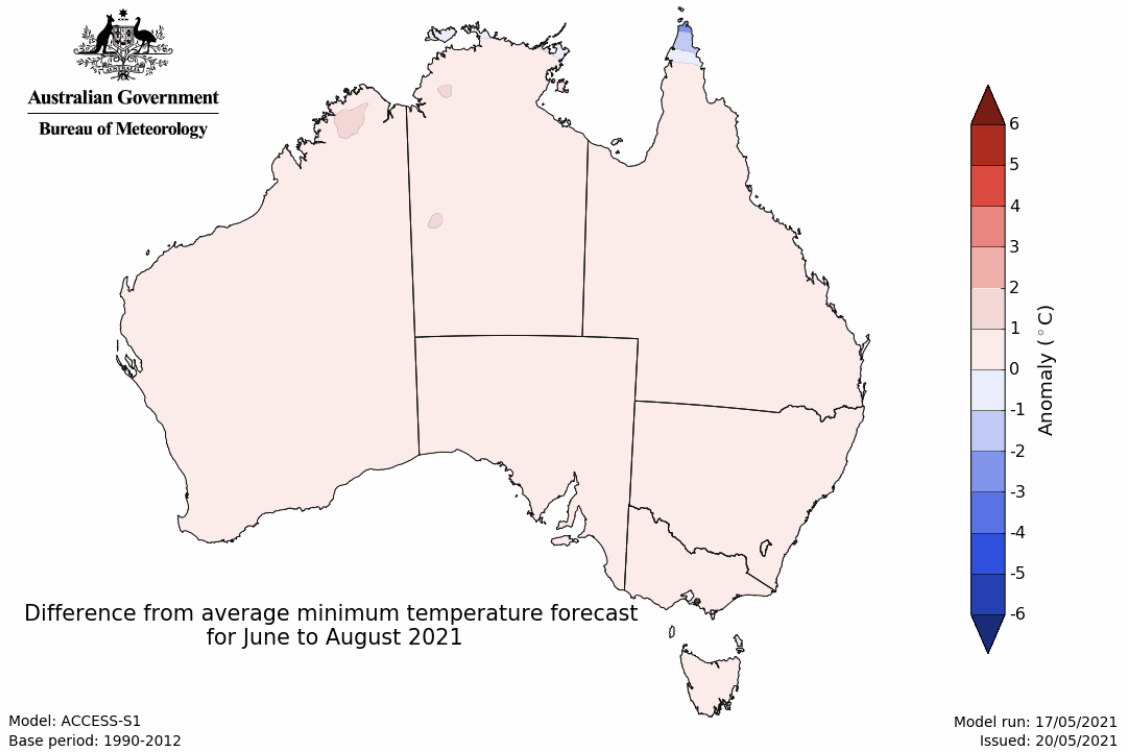
The temperature outlook for June to August 2021 indicates that day-time and night-time temperatures across most of Australia are likely to be close to the 1990-2012 average (- 1°C to 1°C) (Bureau of Meteorology 'National Climate Outlook', 20 May 2021).

Predicted maximum temperature anomaly for June to August 2021



Predicted minimum temperature anomaly for June to August 2021



1.4. Rainfall forecast for the next eight days

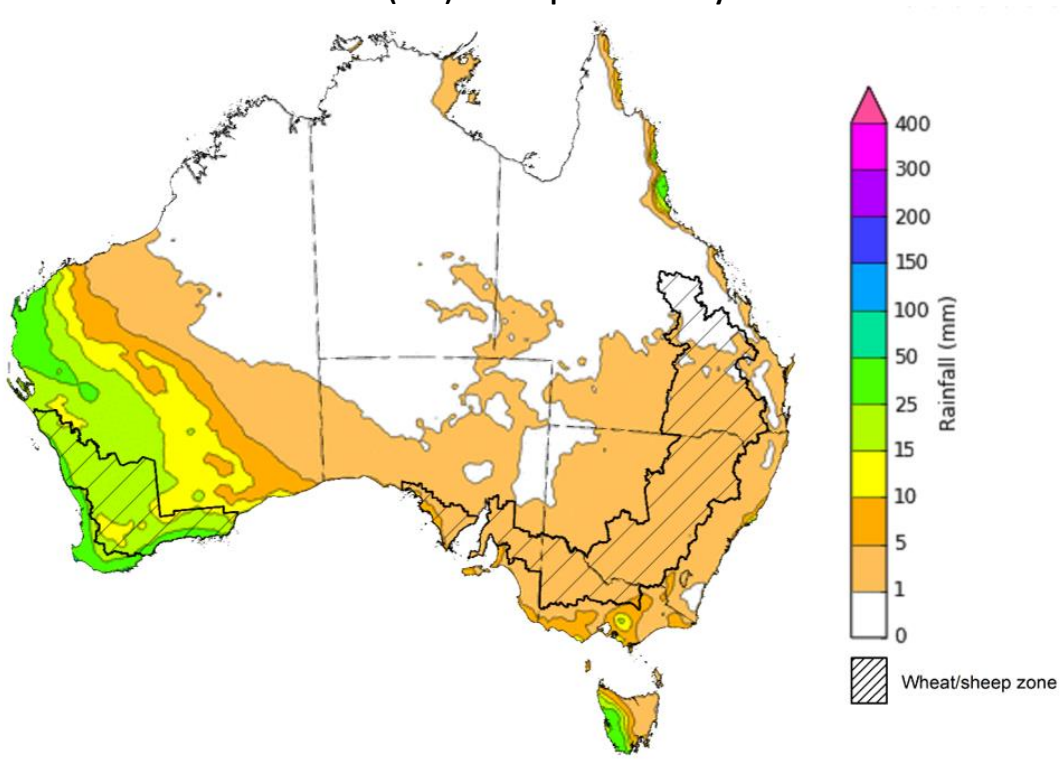
Low-pressure troughs and cold fronts are likely to bring showers and storms to parts of Western Australia and Tasmania the 8 days to 27 May 2021. High-pressure systems are expected to keep rainfall totals low for the majority of central and south-eastern Australia during the next 8 days.

Rainfall totals of between 5 and 50 millimetres are forecast for isolated parts of north-eastern Queensland, southern Victoria, western Tasmania and much of the west and south of Western Australia.

In Australia's cropping regions, rainfall totals of between 10 and 50 millimetres are forecast for Western Australia. Rainfall totals of between 5 and 10 millimetres are forecast for isolated parts of western South Australian cropping regions. Little to no rainfall is expected across cropping regions in Queensland, New South Wales, Victoria and remaining cropping regions in South Australia.

The falls across Western Australian cropping regions will likely benefit the establishment and growth of early sown winter crops and allow farmers to finalise planting programs. The dry forecast for the next 8 days across remaining cropping regions will allow for further planting and adequate soil moisture in parts of New South Wales, southern Queensland and southern Victoria will continue to support crop and pasture growth.

Total forecast rainfall (mm) for the period 27 May to 3 June 2021



 Issued: 27/05/2021

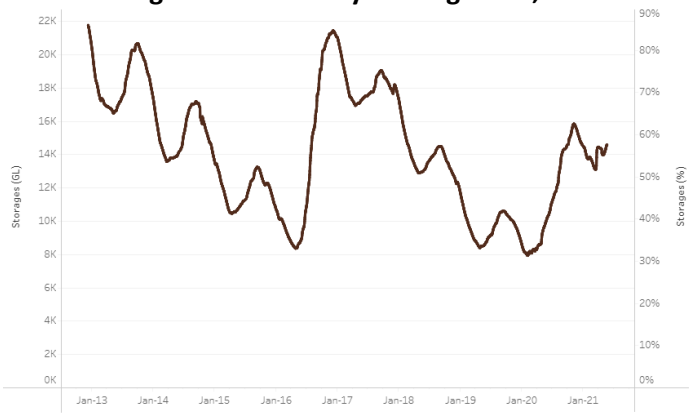
Note: This rainfall forecast is produced from computer models. As the model outputs are not altered by weather forecasters, it is important to check local forecasts and warnings issued by the Bureau of Meteorology.

2. Water

2.1. Water markets – current week

Water storage in the Murray–Darling Basin (MDB) increased by 213 gigalitres (GL) between 18 May 2021 and 25 May 2021. The current volume of water held in storage is 14,558 GL, which represents 58% of total capacity. This is 47% or 4,655 GL more than at the same time last year.

Water storages in the Murray-Darling Basin, 2013–2021

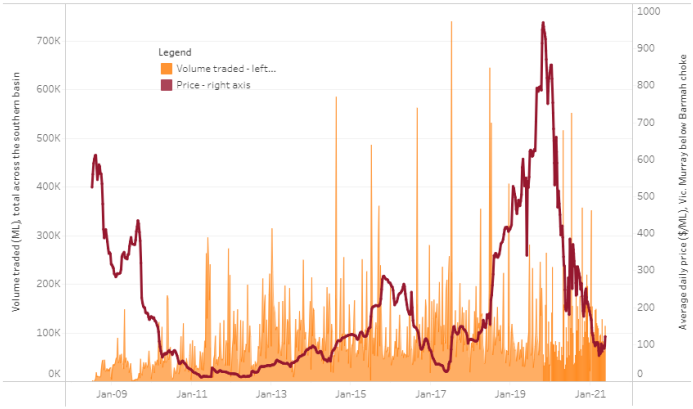


Water storage data is sourced from the Bureau of Meteorology.

Allocation prices in the Victorian Murray below the Barmah Choke increased from $97 per ML on 14 May 2021 to $121 per ML on 21 May 2021. Trade is open from the Murrumbidgee, with prices increasing during the week.

Region	$/ML
NSW Murray Above	91
NSW Murrumbidgee	79
VIC Goulburn-Broken	94
VIC Murray Below	121

Surface water trade activity, Southern Murray–Darling Basin



The trades shown reflect estimated market activity and do not encompass all register trades. The price is shown for the VIC Murray below the Barmah choke. Historical prices (before 1 July 2019) are ABARES estimates after removing outliers from BOM water register data. Prices after 1 July 2019 and prior to the 30 October 2019 reflect recorded transaction prices as sourced from Ruralco. Prices after the 30 October 2019 are sourced from Waterflow. Data for volume traded is sourced from the BOM water register. Data shown is current at 27 May 2021.

To access the full, interactive, weekly water dashboard, which contains the latest and historical water storage, water market and water allocation information, please visit http://www.agriculture.gov.au/abares/products/weekly_update/weekly-update-270521

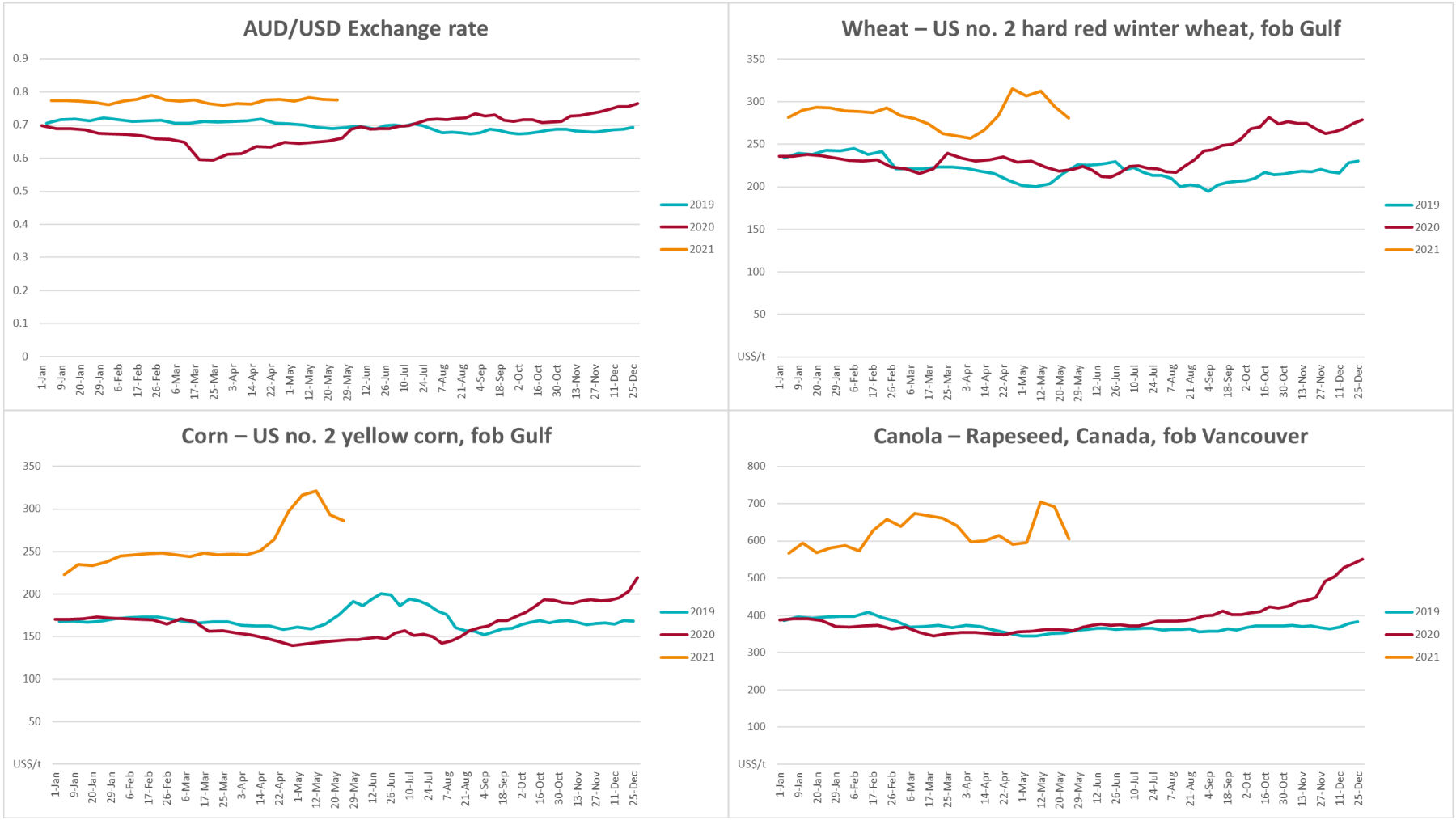
3. Commodities

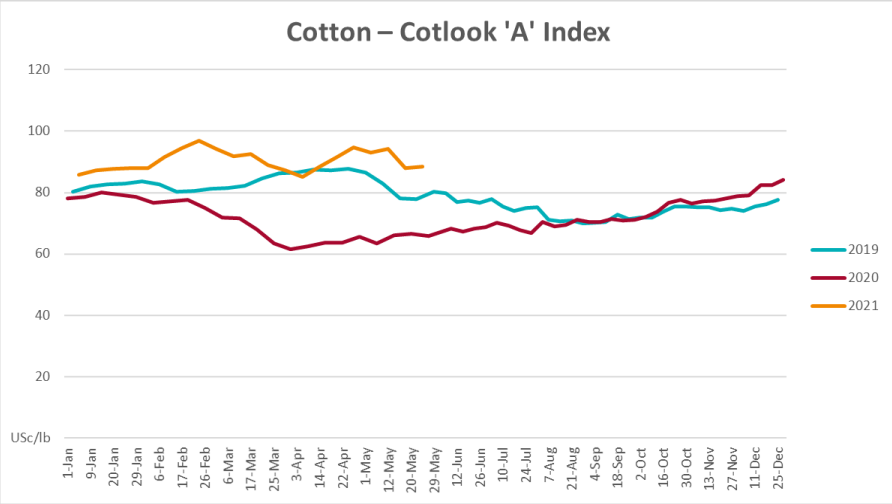
Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
Selected world indicator prices							
AUD/USD Exchange rate	26-May	A$/US$	0.78	0.78	0%	0.69	13%
Wheat – US no. 2 hard red winter wheat, fob Gulf	26-May	US$/t	281	294	-4%	224	25%
Corn – US no. 2 yellow corn, fob Gulf	26-May	US$/t	286	293	-2%	146	96%
Canola – Rapeseed, Canada, fob Vancouver	26-May	US$/t	605	692	-13%	368	64%
Cotton – Cotlook 'A' Index	26-May	USc/lb	88	88	0%	67	32%
Sugar – Intercontinental Exchange, nearby futures, no.11 contract	26-May	USc/lb	17	17	-1%	12	47%
Wool – Eastern Market Indicator	26-May	Ac/kg clean	1,315	1,315	0%	1,292	2%
Wool – Western Market Indicator	19-May	Ac/kg clean	1,361	1,350	1%	1,662	-18%
Selected Australian grain export prices							
Milling Wheat – APW, Port Adelaide, SA	26-May	A$/t	374	372	0%	388	-4%
Feed Wheat – ASW, Port Adelaide, SA	26-May	A$/t	369	368	0%	389	-5%
Feed Barley – Port Adelaide, SA	26-May	A$/t	309	300	3%	292	6%
Canola – Kwinana, WA	26-May	A$/t	742	741	0%	626	19%
Grain Sorghum – Brisbane, QLD	26-May	A$/t	370	368	1%	404	-8%
Selected domestic livestock indicator prices							
Beef – Eastern Young Cattle Indicator	26-May	Ac/kg cwt	887	896	-1%	758	17%
Mutton – Mutton indicator (18–24 kg fat score 2–3), Vic	26-May	Ac/kg cwt	677	654	4%	690	-2%
Lamb – Eastern States Trade Lamb Indicator	26-May	Ac/kg cwt	843	811	4%	941	-10%
Pig – Eastern Seaboard (60.1–75 kg), average of buyers & sellers	19-May	Ac/kg cwt	349	353	-1%	406	-14%
Goats – Eastern States (12.1–16 kg)	26-May	Ac/kg cwt	866	857	1%	760	14%
Live cattle – Light steers ex Darwin to Indonesia	17-Feb	Ac/kg lwt	355	355	0%	360	-1%
Live sheep – Live wethers (Muchea WA saleyard) to Middle East	19-May	$/head	145	145	-1%	N/A	N/A

Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
Global Dairy Trade (GDT) weighted average prices [a]							
Dairy – Whole milk powder	19-May	US$/t	4,123	4,115	0%	3,287	25%
Dairy – Skim milk powder	19-May	US$/t	3,447	3,433	0%	2,468	40%
Dairy – Cheddar cheese	19-May	US$/t	4,321	4,274	1%	4,319	0%
Dairy – Anhydrous milk fat	19-May	US$/t	5,730	5,730	0%	6,126	-6%

a Global Dairy Trade prices are updated twice monthly on the first and third Tuesday of each month.

3.1. Selected world indicator prices




Cotton – Cotlook 'A' Index
120
100
80
60
40
20
USc/lb
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
17-Feb
26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
12-Jun
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10-Jul
24-Jul
7-Aug
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27-Nov
11-Dec
25-Dec
2019
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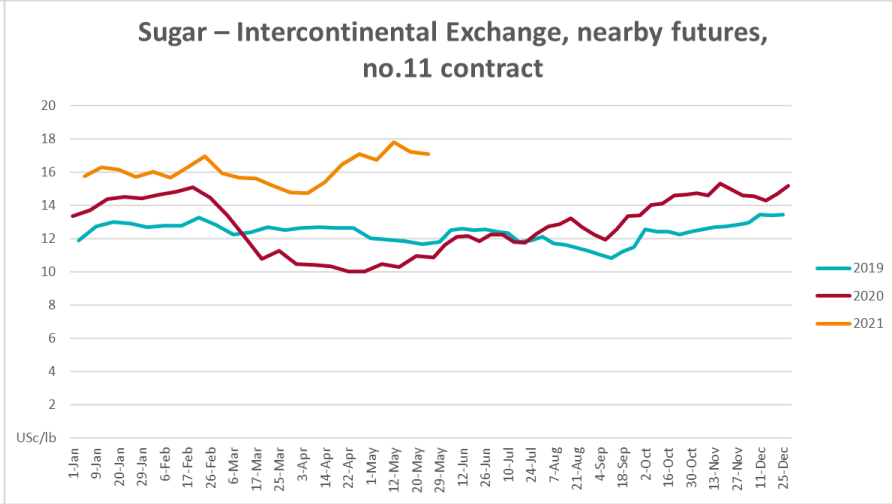
2021


Sugar – Intercontinental Exchange, nearby futures, no.11 contract
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18
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14
12
10
8
6
4
2
USc/lb
1-Jan
9-Jan
20-Jan
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26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
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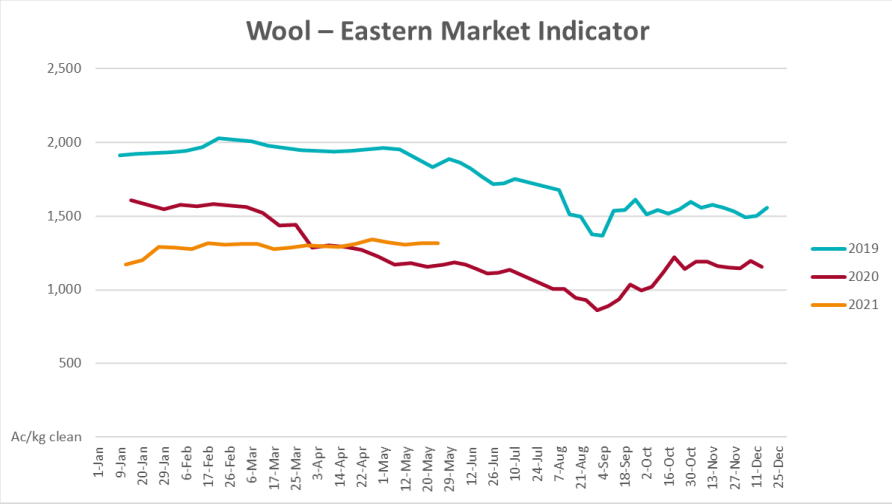
13-Nov
27-Nov
11-Dec
25-Dec
2019
2020
2021


Wool – Eastern Market Indicator
2,500
2,000
1,500
1,000
500
Ac/kg clean
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
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26-Feb
6-Mar
17-Mar
25-Mar
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14-Apr
22-Apr
1-May
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29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
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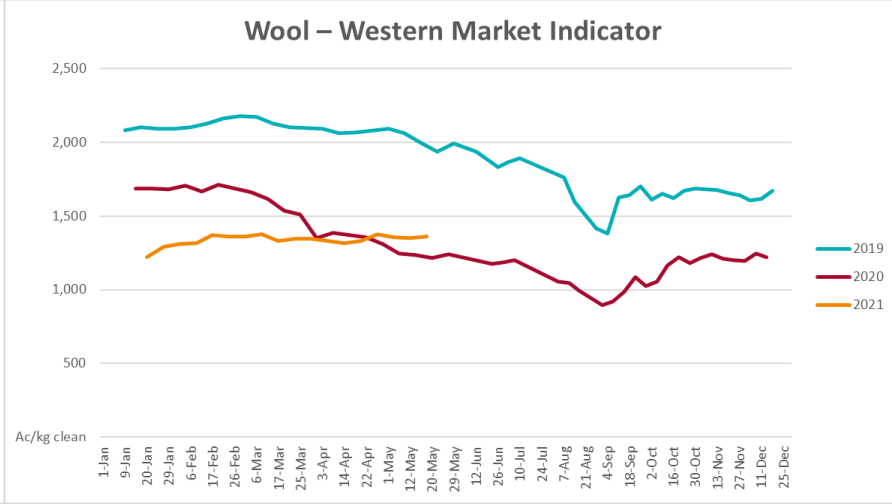
27-Nov
11-Dec
25-Dec
2019
2020
2021


Wool – Western Market Indicator
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2,000
1,500
1,000
500
Ac/kg clean
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
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6-Mar
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25-Mar
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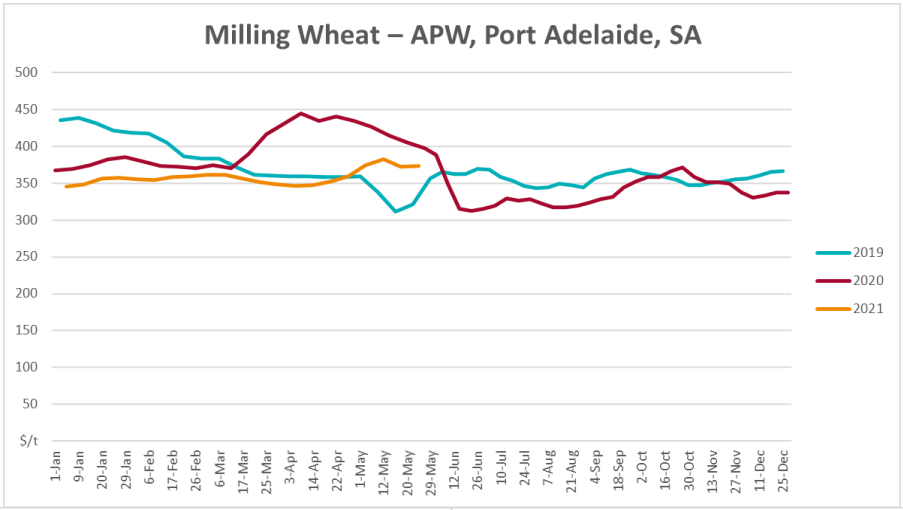
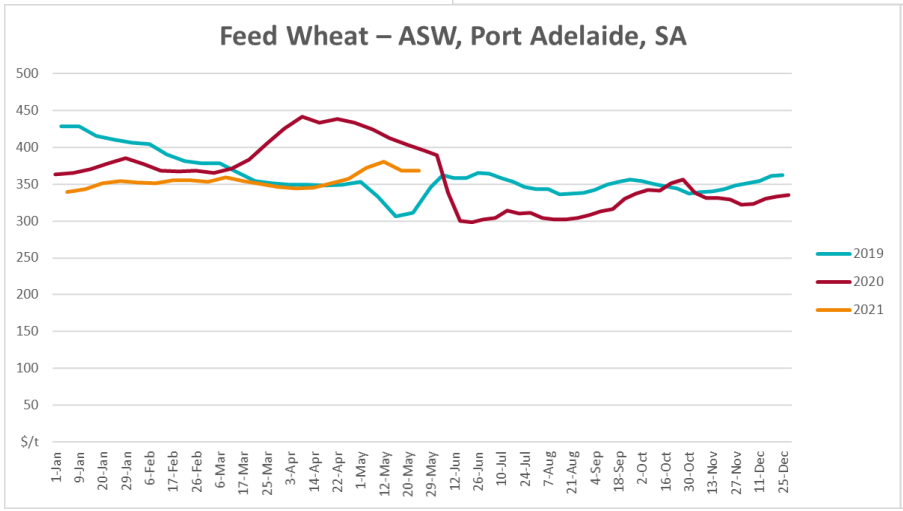
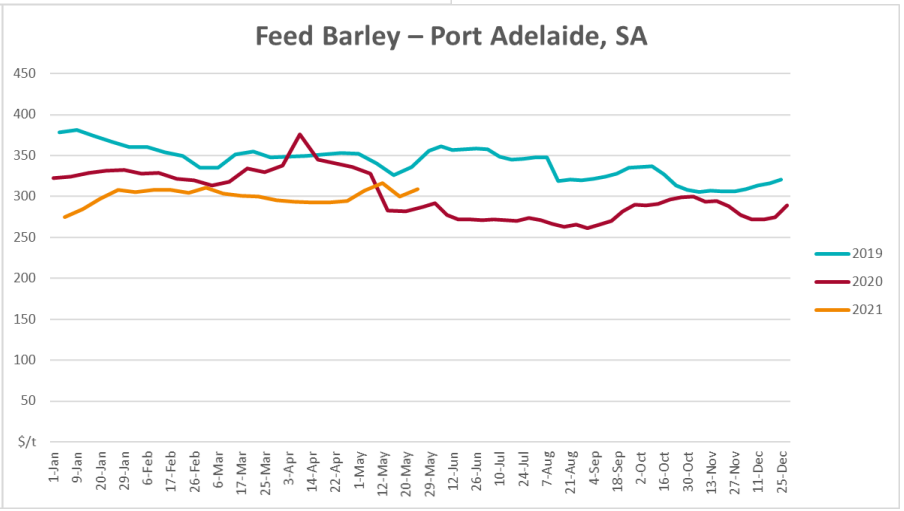
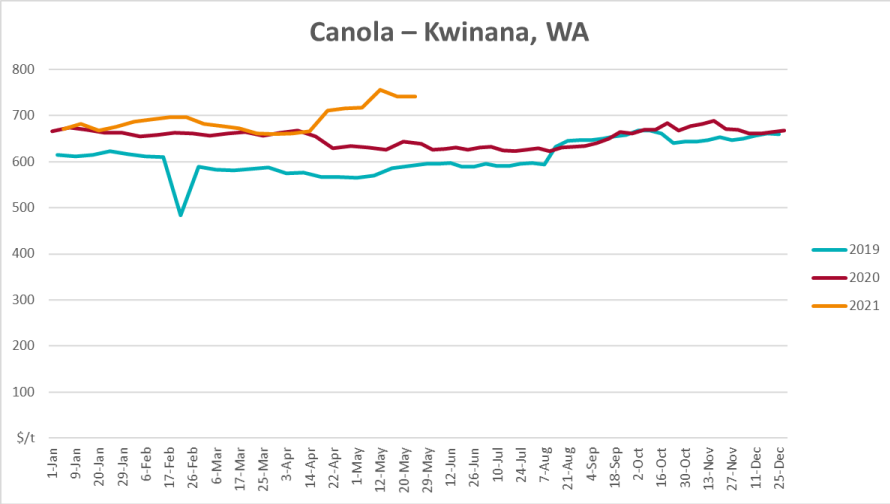
14-Apr
22-Apr
1-May
12-May
20-May
29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
21-Aug
4-Sep
18-Sep
2-Oct
16-Oct
30-Oct
13-Nov
27-Nov
11-Dec
25-Dec
2019
2020
2021

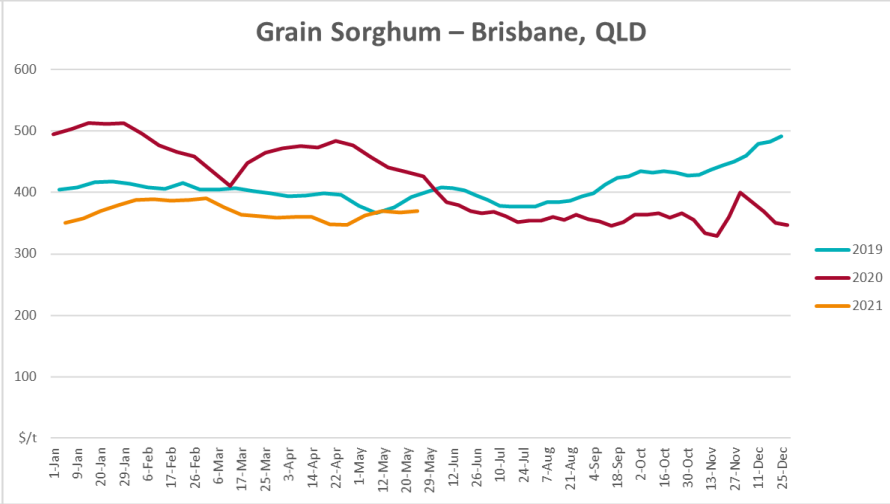
3.2. Selected domestic crop indicator prices



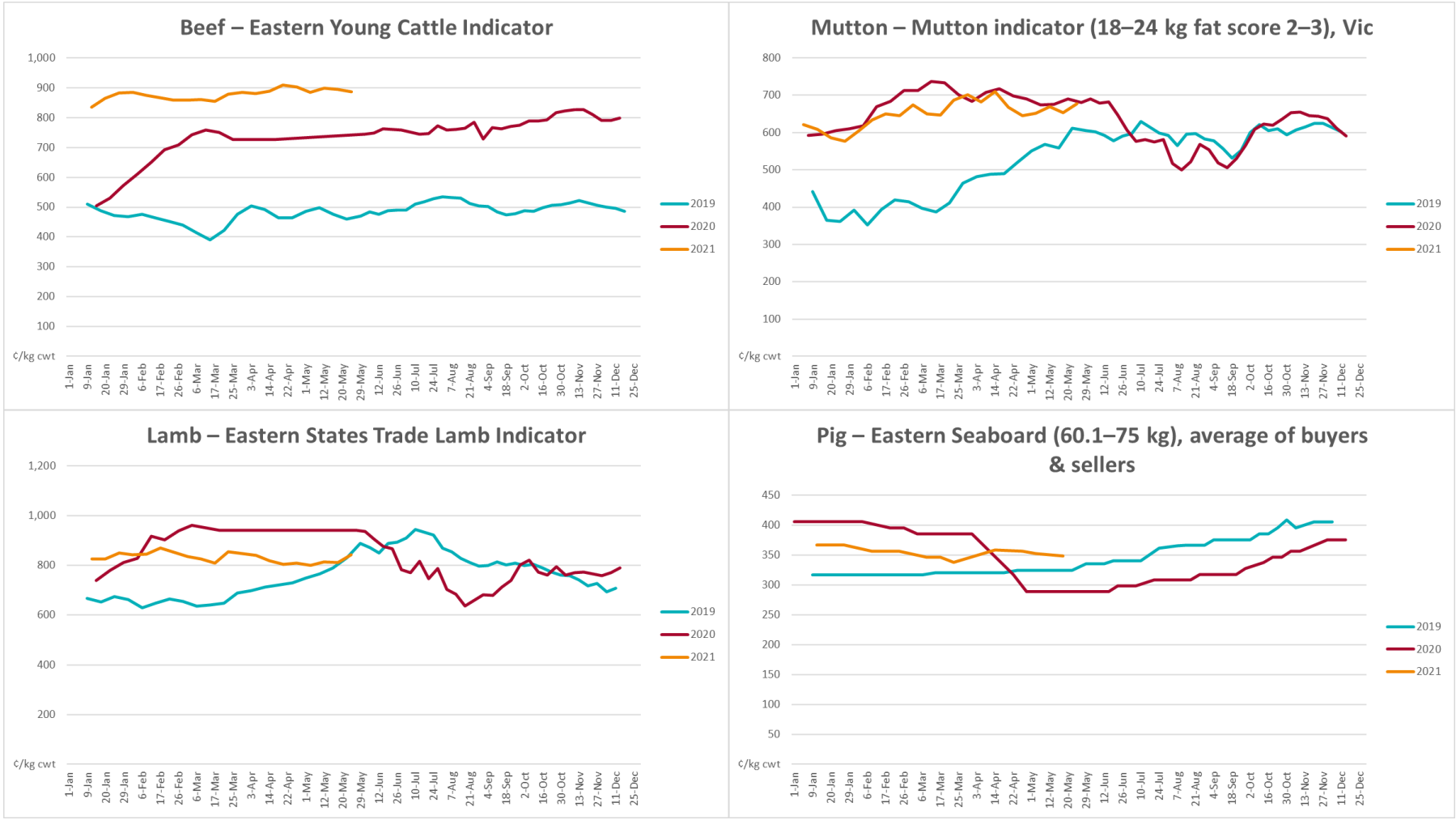


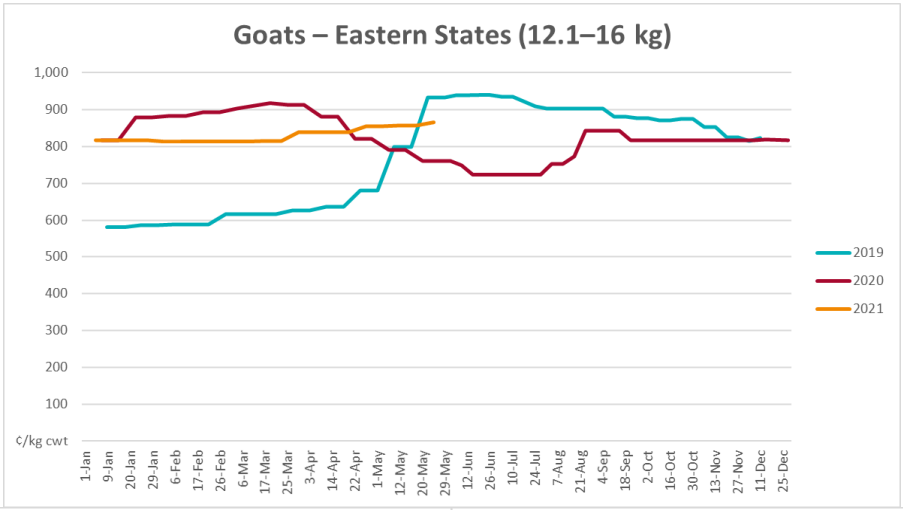


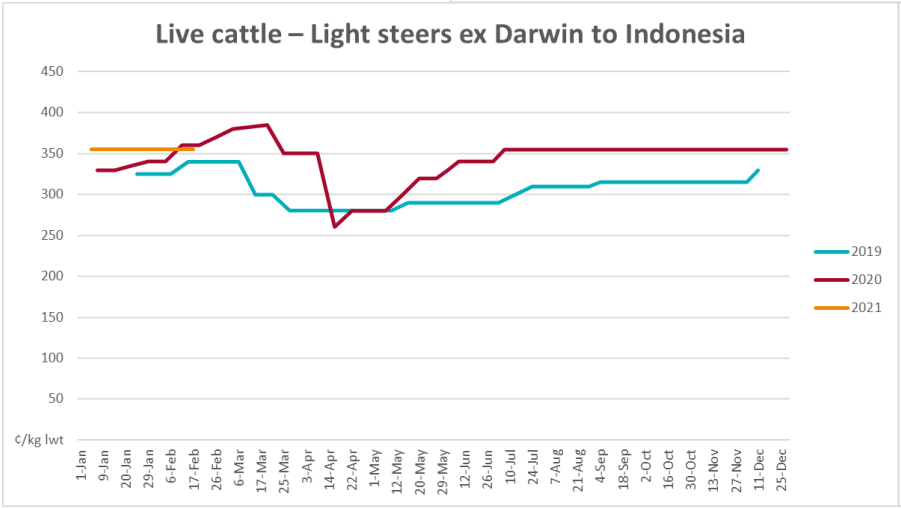

Canola – Kwinana, WA
800
700
600
500
400
300
200
100
$/t
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
17-Feb
26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
21-Aug
4-Sep
18-Sep
2-Oct
16-Oct
30-Oct
13-Nov
27-Nov
11-Dec
25-Dec
2019
2020
2021

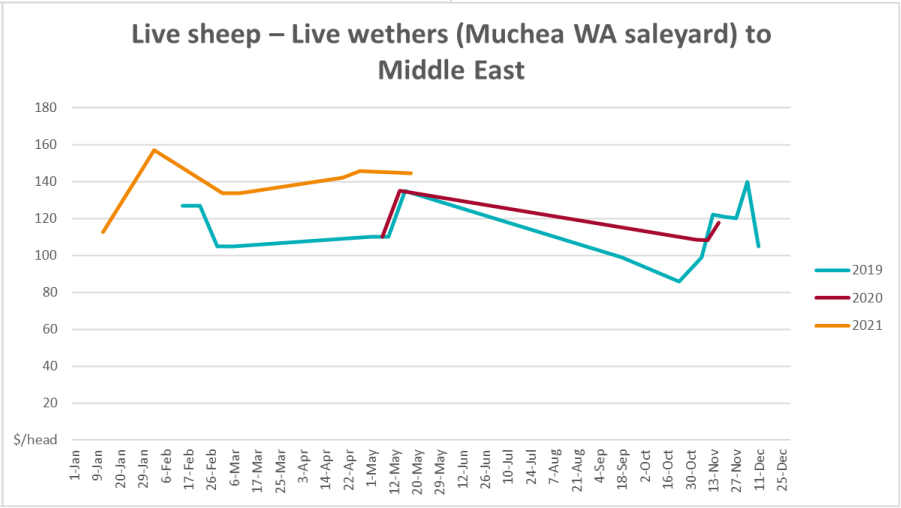

Grain Sorghum – Brisbane, QLD
600
500
400
300
200
100
$/t
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
17-Feb
26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
21-Aug
4-Sep
18-Sep
2-Oct
16-Oct
30-Oct
13-Nov
27-Nov
11-Dec
25-Dec
2019
2020
2021

3.3. Selected domestic livestock indicator prices

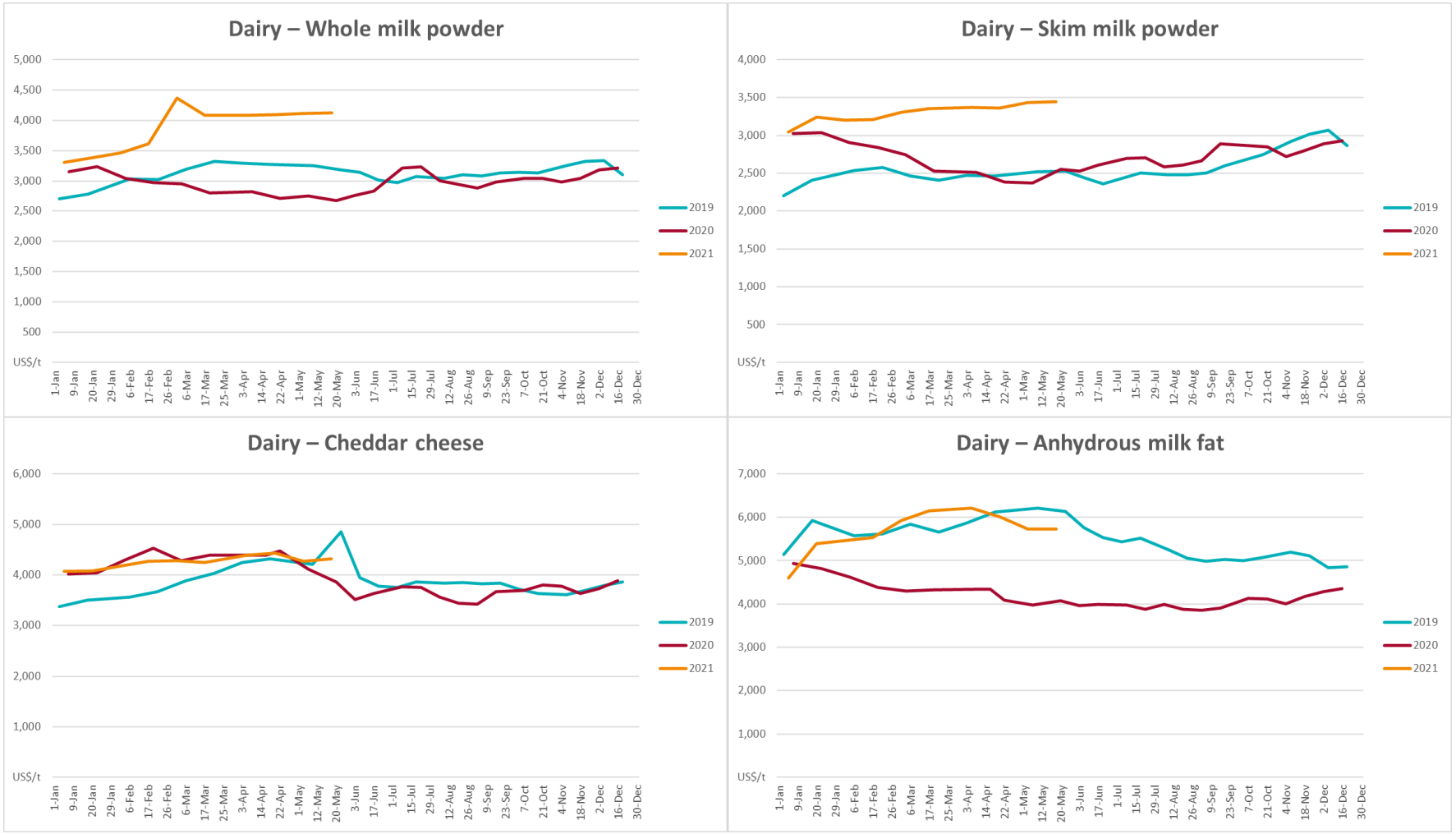



Goats – Eastern States (12.1–16 kg)
1,000
900
800
700
600
500
400
300
200
100
¢/kg cwt
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
17-Feb
26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
21-Aug
4-Sep
18-Sep
2-Oct
16-Oct
30-Oct
13-Nov
27-Nov
11-Dec
25-Dec
2019
2020
2021

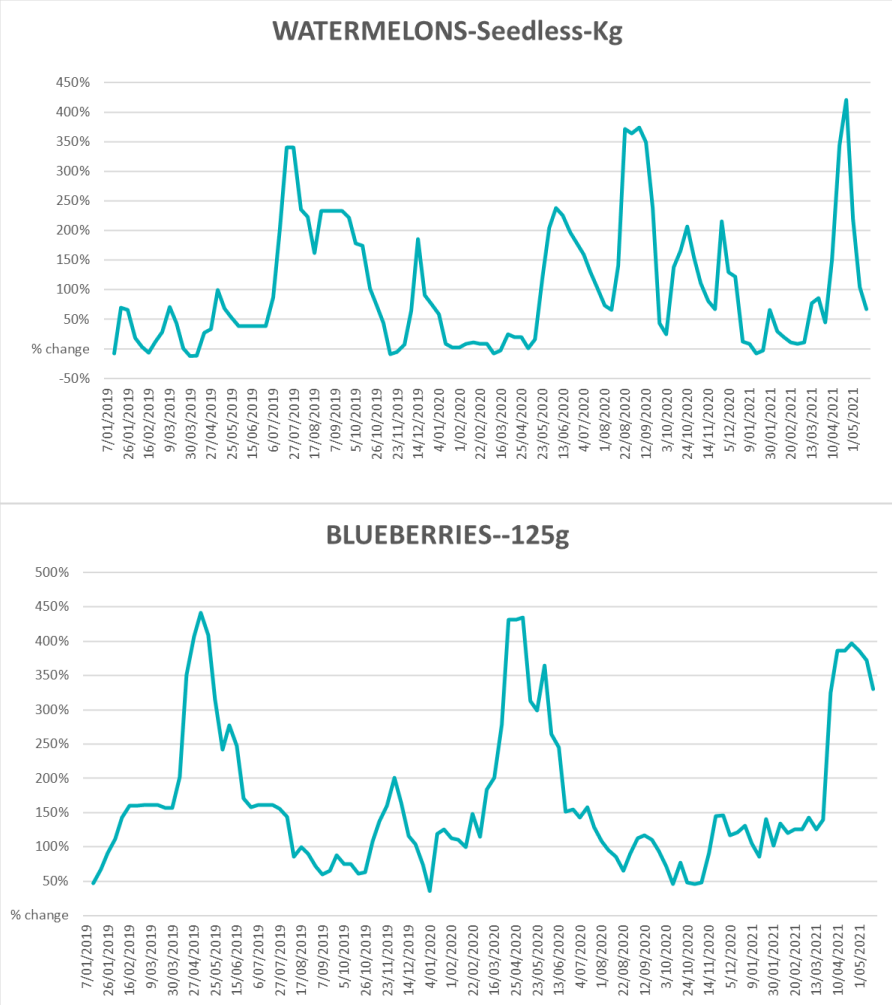

Live cattle – Light steers ex Darwin to Indonesia
450
400
350
300
250
200
150
100
50
¢/kg lwt
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
17-Feb
26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
21-Aug
4-Sep
18-Sep
2-Oct
16-Oct
30-Oct
13-Nov
27-Nov
11-Dec
25-Dec
2019
2020
2021

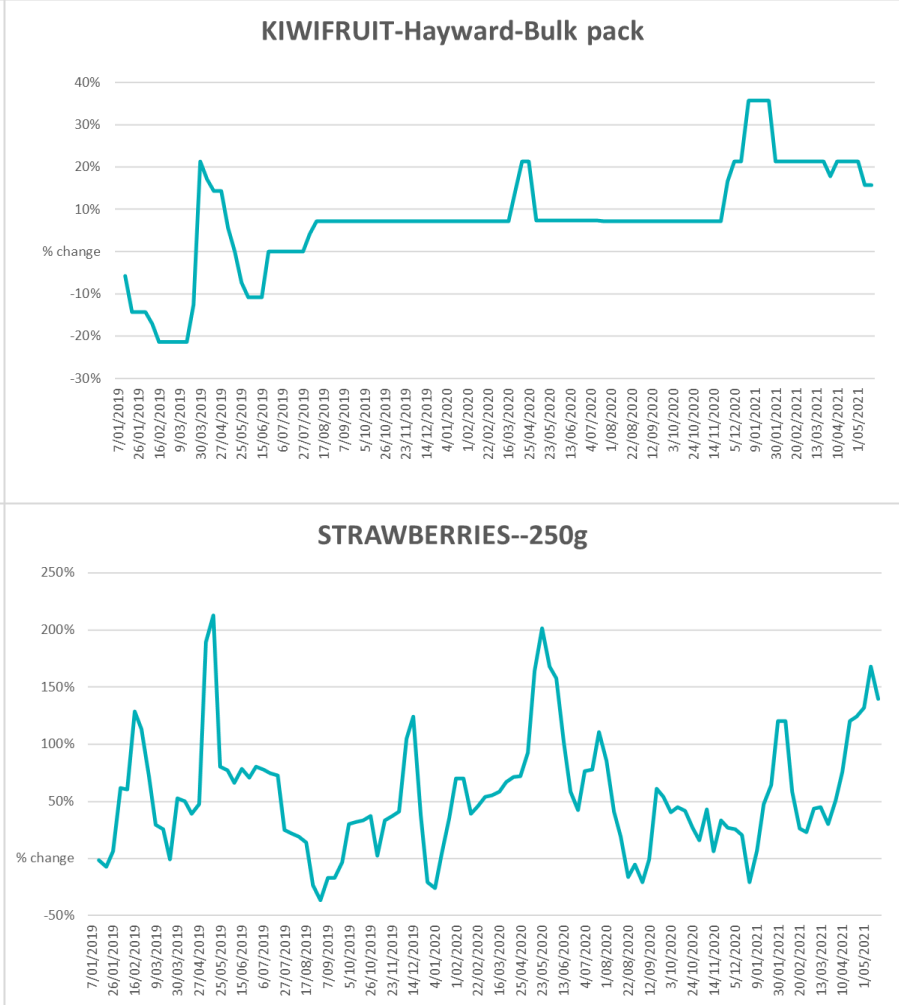

Live sheep – Live wethers (Muchea WA saleyard) to Middle East
180
160
140
120
100
80
60
40
20
$/head
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
17-Feb
26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
21-Aug
4-Sep
18-Sep
2-Oct
16-Oct
30-Oct
13-Nov
27-Nov
11-Dec
25-Dec
2019
2020
2021

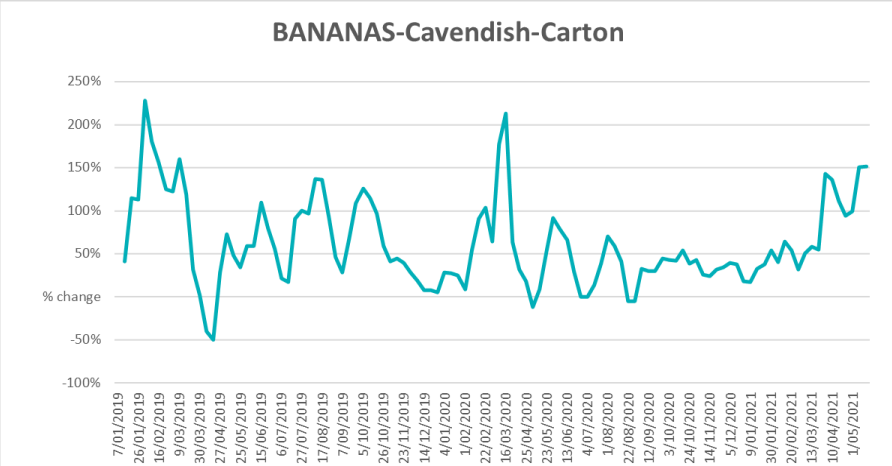
3.4. Global Dairy Trade (GDT) weighted average prices

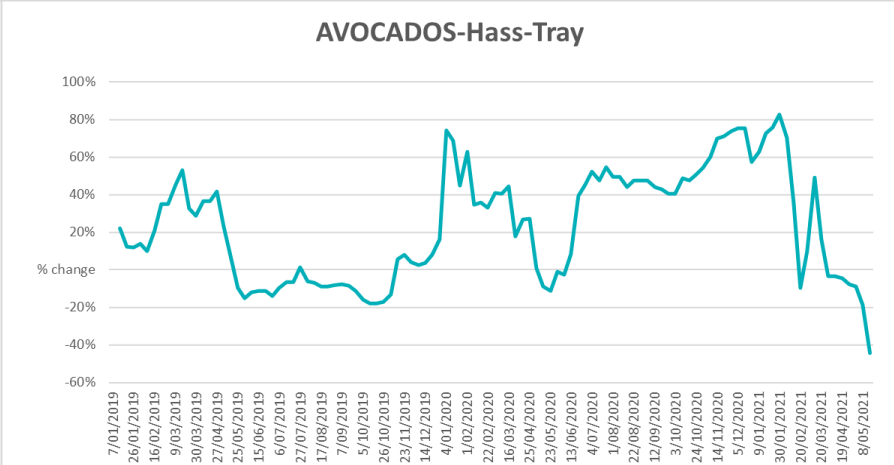


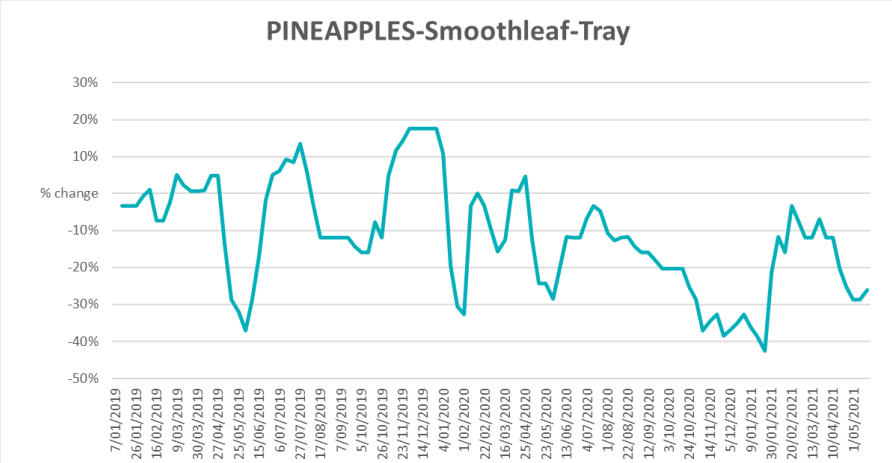
3.5. Selected fruit and vegetable prices

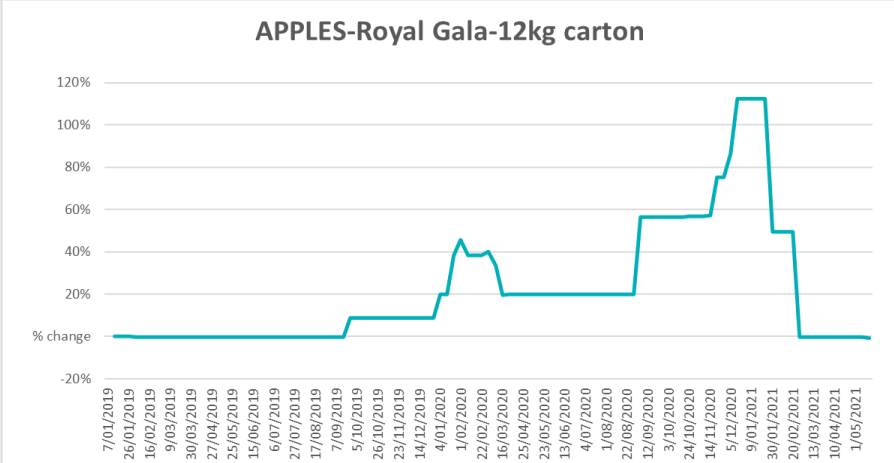


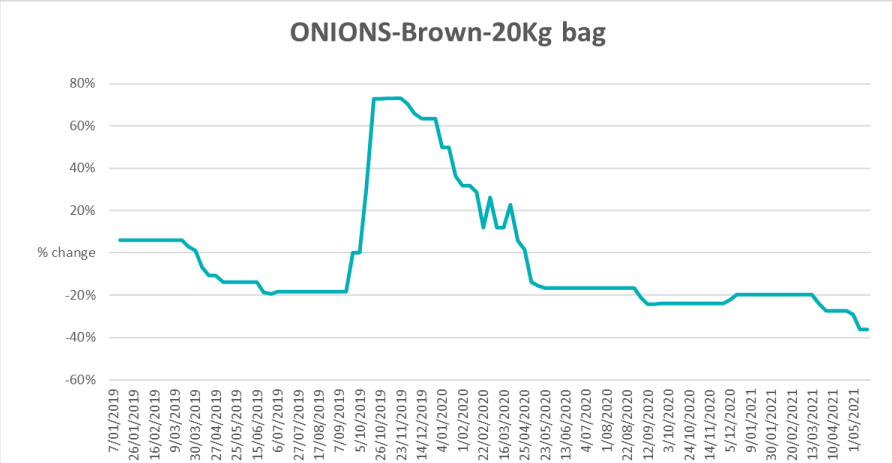


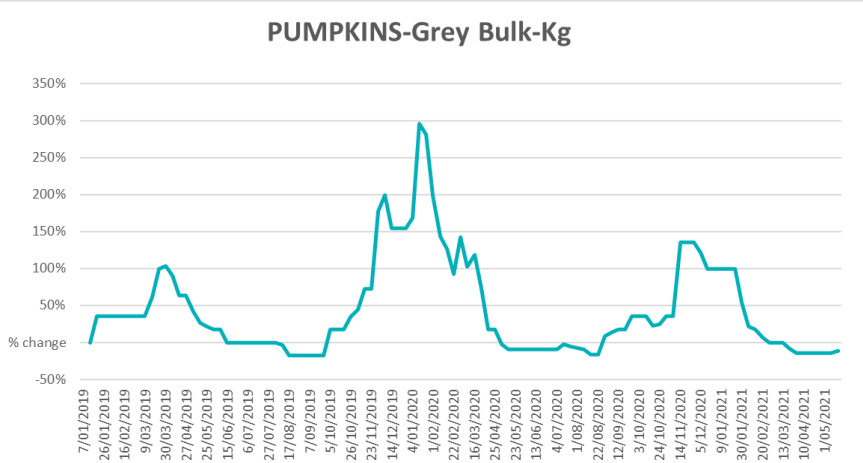

BANANAS-Cavendish-Carton
250%
200%
150%
100%
50%
% change
-50%
-100%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021

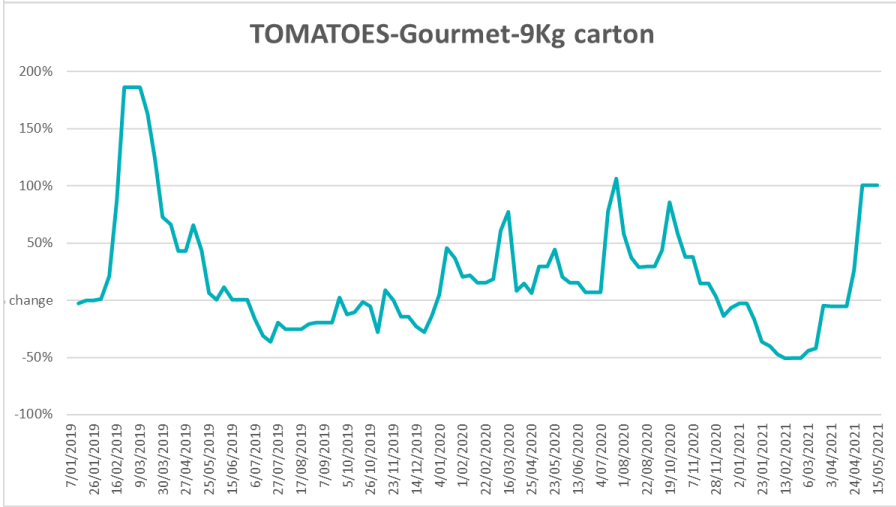

AVOCADOS-Hass-Tray
100%
80%
60%
40%
20%
% change
-20%
-40%
-60%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
20/03/2021
19/04/2021
8/05/2021

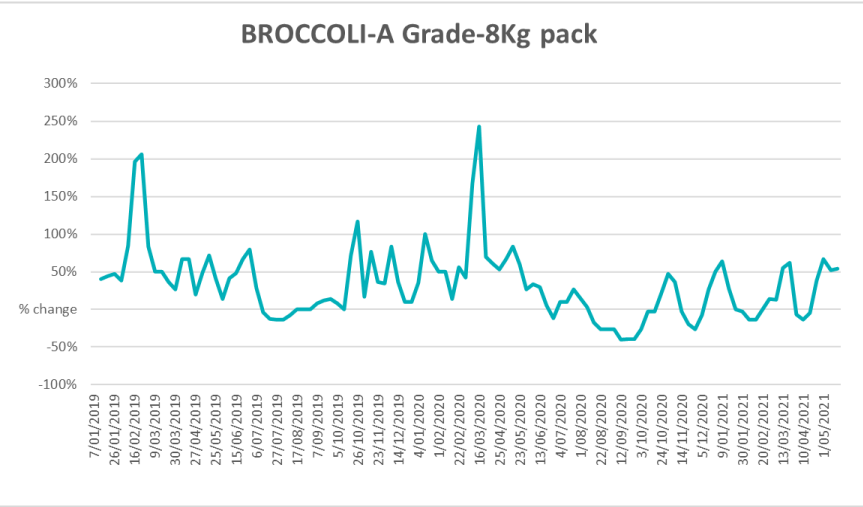

PINEAPPLES-Smoothleaf-Tray
30%
20%
10%
% change
-10%
-20%
-30%
-40%
-50%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021

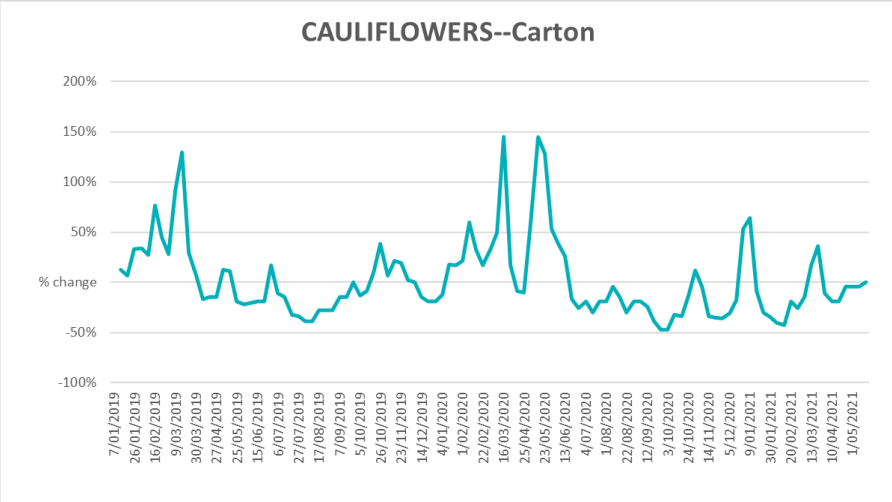

APPLES-Royal Gala-12kg carton
120%
100%
80%
60%
40%
20%
% change
-20%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021

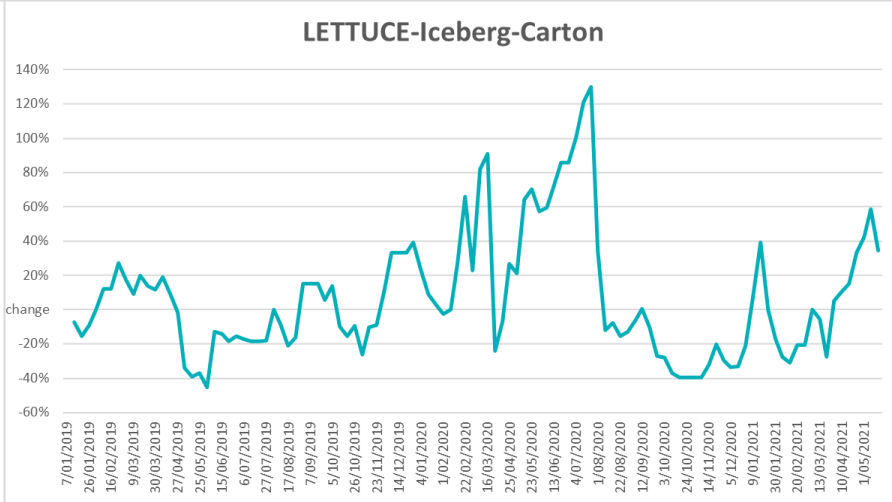

ONIONS-Brown-20Kg bag
80%
60%
40%
20%
% change
-20%
-40%
-60%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021

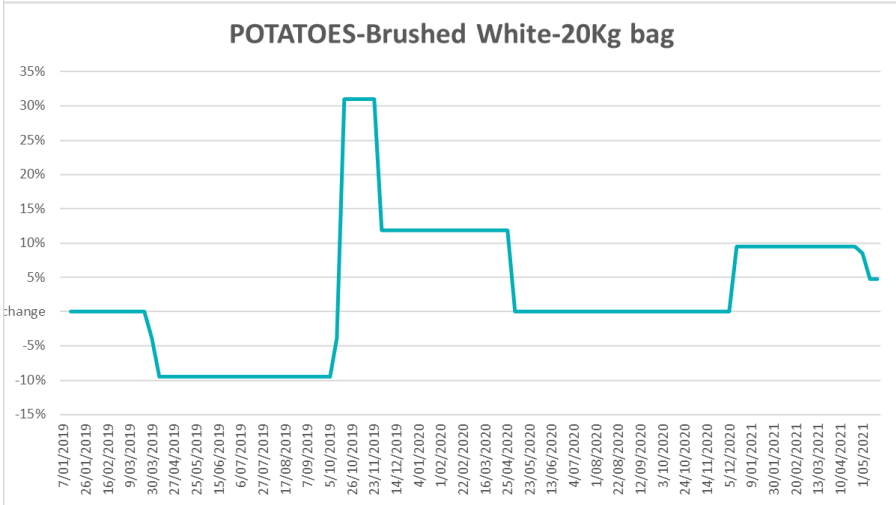

PUMPKINS-Grey Bulk-Kg
350%
300%
250%
200%
150%
100%
50%
% change
-50%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021

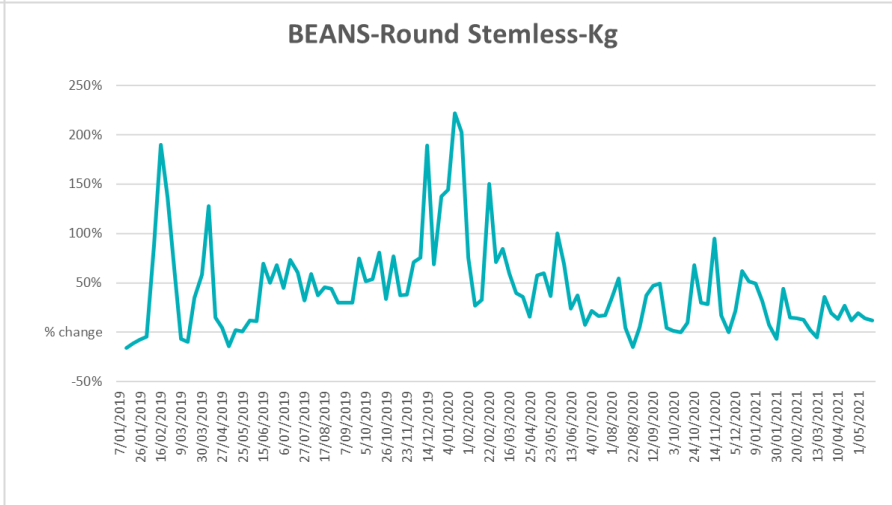

TOMATOES-Gourmet-9Kg carton
200%
150%
100%
50%
change
-50%
-100%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
19/10/2020
7/11/2020
28/11/2020
2/01/2021
23/01/2021
13/02/2021
6/03/2021
3/04/2021
24/04/2021
15/05/2021


BROCCOLI-A Grade-8Kg pack
300%
250%
200%
150%
100%
50%
% change
-50%
-100%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021


CAULIFLOWERS--Carton
200%
150%
100%
50%
% change
-50%
-100%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021


LETTUCE-Iceberg-Carton
140%
120%
100%
80%
60%
40%
20%
change
-20%
-40%
-60%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021


POTATOES-Brushed White-20Kg bag
35%
30%
25%
20%
15%
10%
5%
change
-5%
-10%
-15%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021


BEANS-Round Stemless-Kg
250%
200%
150%
100%
50%
% change
-50%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021

4. Data attribution

Climate

Bureau of Meteorology

- Weekly rainfall totals: www.bom.gov.au/climate/maps/rainfall/
- Monthly and last 3-month rainfall percentiles: www.bom.gov.au/water/landscape/
- Temperature anomalies: www.bom.gov.au/jsp/awap/temp/index.jsp
- Rainfall forecast: www.bom.gov.au/jsp/watl/rainfall/pme.jsp
- Seasonal outlook: www.bom.gov.au/climate/outlooks/#/overview/summary/
- Climate drivers: http://www.bom.gov.au/climate/enso/
- Soil moisture: www.bom.gov.au/water/landscape/

Other

- Pasture growth: www.longpaddock.qld.gov.au/aussiegrass/
- 3-month global outlooks: Environment and Climate Change Canada, NOAA Climate Prediction Center, EUROBRISA CPTEC/INPE, European Centre for Medium-Range Weather Forecasts, Hydrometcenter of Russia, National Climate Center Climate System Diagnosis and Prediction Room (NCC), International Research Institute for Climate and Society
- Global production: https://ipad.fas.usda.gov/ogamaps/cropmapsandcalendars.aspx
- Autumn break: Pook et al., 2009, https://rmets-onlinelibrary-wiley-com.virtual.anu.edu.au/doi/epdf/10.1002/joc.1833

Water

Prices

- Waterflow: https://www.waterflow.io/
- Ruralco: https://www.ruralcowater.com.au/

Bureau of Meteorology:

- Allocation trade: http://www.bom.gov.au/water/dashboards/#/water-markets/mdb/at
- Storage volumes: http://www.bom.gov.au/water/dashboards/#/water-storages/summary/drainage

Trade constraints:

- Water NSW: https://www.waternsw.com.au/customer-service/ordering-trading-and-pricing/trading/murrumbidgee
- Victorian Water Register: https://www.waterregister.vic.gov.au/TradingRules2019/

Commodities

Fruit and vegetables

- Datafresh: www.freshstate.com.au

Pigs

- Australian Pork Limited: www.australianpork.com.au

Dairy

- Global Dairy Trade: www.globaldairytrade.info/en/product-results/

World wheat, canola

- International Grains Council

World coarse grains

- United States Department of Agriculture

World cotton

- Cotlook: www.cotlook.com/

World sugar

- New York Stock Exchange - Intercontinental Exchange

Wool

- Australian Wool Exchange: www.awex.com.au/

Domestic wheat, barley, sorghum and canola

- Jumbuk Consulting Pty Ltd: http://www.jumbukag.com.au/

Cattle, beef, mutton, lamb, goat and live export

- Meat and Livestock Australia: www.mla.com.au/Prices-and-market

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