



# Weekly Australian Climate, Water and Agricultural Update

No. 22/2021

10 June 2021

## Summary of key issues

- During the week ending 9 June 2021, low pressure troughs and cold fronts brought moderate rainfall to south-eastern Australia and parts of Western Australia ([see Section 1.1](#)).
- The rainfall across eastern Australian cropping regions has provided much needed moisture to south-western Victoria and parts South Australia to assist with winter crop germination and establishment. However, cropping regions in north-western Victoria and eastern South Australia are still awaiting substantial rainfall to assist with winter crop germination and establishment.
- Nationally, plant growth conditions during the 2021 autumn were above average across parts of eastern, western and central Australia, but generally below average across parts of southern and northern Australia. As a result, livestock producers in some southern regions will be heavily reliant on winter rainfall to build soil moisture levels and supplementary feeding to maintain current stock numbers ([see Section 1.2](#)).
- The Southern Annular Mode (SAM) has also recently shifted to positive values. Given current and expected conditions, the Indian Ocean Dipole (IOD) and SAM are likely to enhance winter rainfall across parts of Australia ([see Section 1.3](#)).
- These rainfall totals are average to above average for this three-month period across most cropping regions. Above average soil moisture levels in New South Wales, and parts of Queensland and Western Australia and the probability of average to above average in-season rainfall in July to September will assist with maintaining current yield potential in winter crops ([see Section 1.4](#)).
- Low pressure systems and troughs are likely to bring showers and storms to parts of southern Australia during the 8 days to 10 June 2021.
- In the next eight days across Australia's cropping regions, rainfall totals of between 10 and 50 millimetres are forecast for much of New South Wales and South Australia and parts of eastern Victoria and Western Australia. If realised, the rainfall forecast across many South Australian cropping regions will continue to assist with the germination and establishment of dry sown crops and boost soil moisture. The falls forecast across New South Wales, eastern Victoria and parts of Western Australia will likely support the growth of sown winter crops and allow farmers to finalise planting programs ([see Section 1.5](#)).
- Water storage in the Murray–Darling Basin (MDB) increased by 100 gigalitres (GL) between 2 June 2021 and 9 June 2021. The current volume of water held in storage is 14,894 GL, which represents 59% of total capacity. This is 45% or 4,597 GL more than at the same time last year.
- Allocation prices in the Victorian Murray below the Barmah Choke increased from \$94 per ML on 28 May 2021 to \$102 per ML on 4 June 2021. Prices are lower in the Murrumbidgee due to the binding of the Murrumbidgee export limit.

# 1. Climate

## 1.1. Rainfall this week

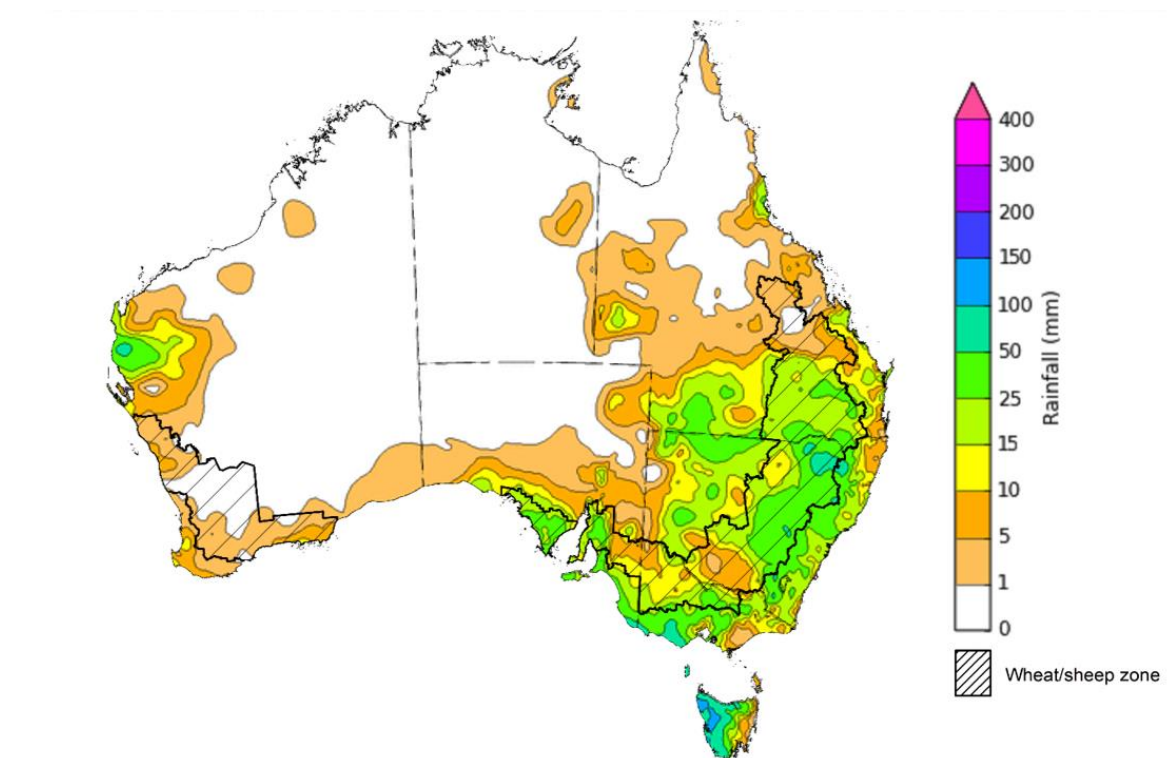
During the week ending 9 June 2021, low pressure troughs and cold fronts brought moderate rainfall to south-eastern Australia and parts of Western Australia. Blocking high pressure systems restricted rainfall across the remainder of Australia.

Rainfall totals of between 10 and 50 millimetres were recorded across much of New South Wales and Victoria, and parts of southern Queensland, southern South Australia, the west of Western Australia and eastern Tasmania. Rainfall totals in excess of 50 millimetres were recorded across isolated parts of north-eastern New South Wales, southern Victoria and western Tasmania.

In cropping regions, rainfall totals of between 10 and 50 millimetres were recorded across much of central and northern New South Wales, central and southern Queensland, eastern and southern Victoria, and western and south-eastern South Australia. Little to no rainfall was recorded across cropping regions in Western Australia and remaining cropping regions in southern New South Wales, north-western Victoria and north-eastern South Australia cropping regions during the week ending 9 June 2021.

The rainfall across eastern Australian cropping regions has provided much needed moisture to south-western Victoria and much of South Australia to assist with winter crop germination and establishment. This substantial rainfall will also support the development of established crops in much of New South Wales and Queensland. Cropping regions in north-western Victoria and eastern South Australia are still awaiting substantial rainfall to assist with winter crop germination and establishment.

**Rainfall for the week ending 9 June 2021**



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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. Pasture growth

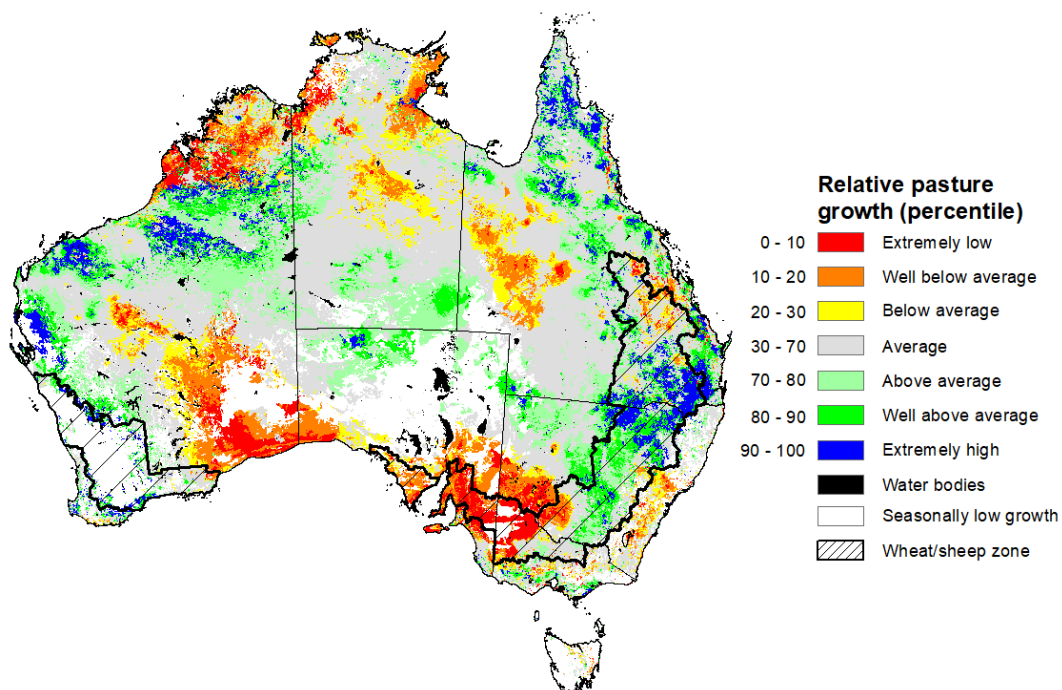
Pasture growth during the March to May period affects the availability of fodder to support livestock production across northern Australia as it enters a seasonally low growth period. Across southern Australia, autumn pasture growth influences the standing biomass available to support livestock production over winter and the reliance on hay and grain during this period.

For the 3 months to May 2021, below average rainfall and generally below average soil moisture limited pasture production across parts of southern and northern Australia. In contrast, average or better autumn rainfall and generally average soil moisture benefitted pasture production across parts of western, eastern and central Australia.

Modelled pasture growth was extremely low to below average across parts of south-western New South Wales, western and central-eastern Queensland, western Victoria, southern South Australia, south-eastern and northern Western Australia and the northern half of the Northern Territory. As a result, livestock producers in some southern regions will be heavily reliant on winter rainfall to build soil moisture levels and supplementary feed to maintain current stock numbers.

In contrast, modelled pasture growth was above average to extremely high across large areas of New South Wales, Queensland, Western Australia and central Australia. This growth is likely to enable farmers to continue to rebuild stock numbers and provide opportunities to replenish fodder supplies.

**Relative pasture growth for autumn 2021 (1 March to 31 May 2021)**



Notes: AussieGRASS pasture growth estimates are relative to the long-term record and shown in percentiles. Percentiles rank data on a scale of zero to 100. This analysis ranks pasture growth for the selected period against average pasture growth for the long-term record (1957 to 2016). Pasture growth is modelled at 5km<sup>2</sup> grid cells.  
Source: Queensland Department of Science, Information Technology and Innovation

### 1.3. 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.

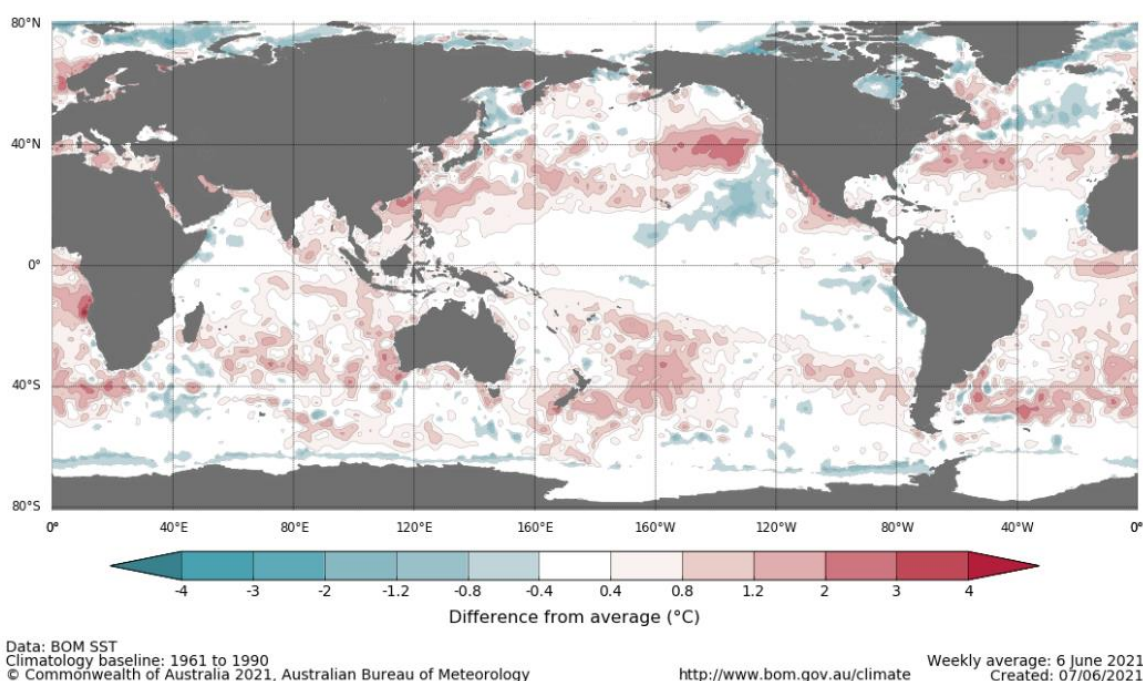
Analysis of oceanic and atmospheric indicators suggest that ENSO conditions remain neutral, reducing its influence on Australia's climate patterns. Sea surface temperatures in the tropical Indian Ocean, on the other hand, indicate the potential development of a negative IOD event. The SAM has also recently shifted to positive values. Given current and expected conditions, the IOD and SAM are likely to be the major influences on winter rainfall across Australia.

A negative IOD event is yet to be declared but may eventuate if current conditions in the Indian Ocean persist. Warmer than average water temperatures in the east Indian Ocean and cooler than average temperatures in the west can result in above average rainfall across southern Australia throughout winter and spring. The SAM has recently shifted to positive and is expected to remain positive over the next two weeks. During winter, a positive SAM can enhance rainfall for western parts of the coastline of the Great Australian Bight, New South Wales, and southern Queensland, and reduce rainfall over south-western Western Australia, south-eastern Australia, and Tasmania.

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 8 June 2021, all of the international climate models surveyed predict sea surface temperatures in the tropical Pacific to remain neutral until at least October.

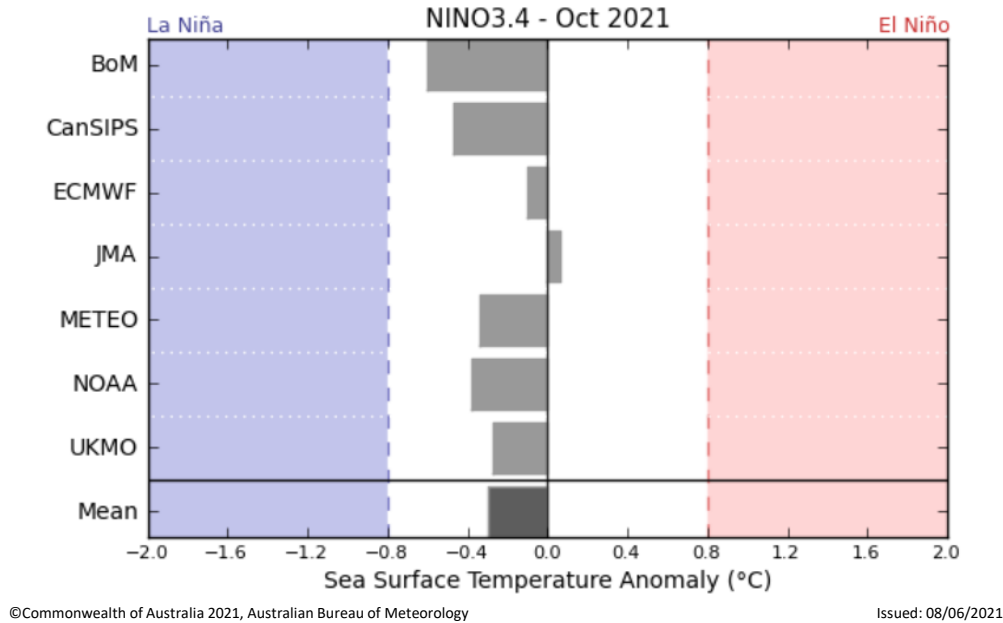
Sea surface temperatures near Western Australia and Indonesia remain above average. The warm temperature anomalies in the southern and eastern Indian Ocean have remained largely unchanged over the past couple of weeks, while warm anomalies in the western Indian Ocean have weakened. Warm anomalies in 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 31 May to 6 June 2021**

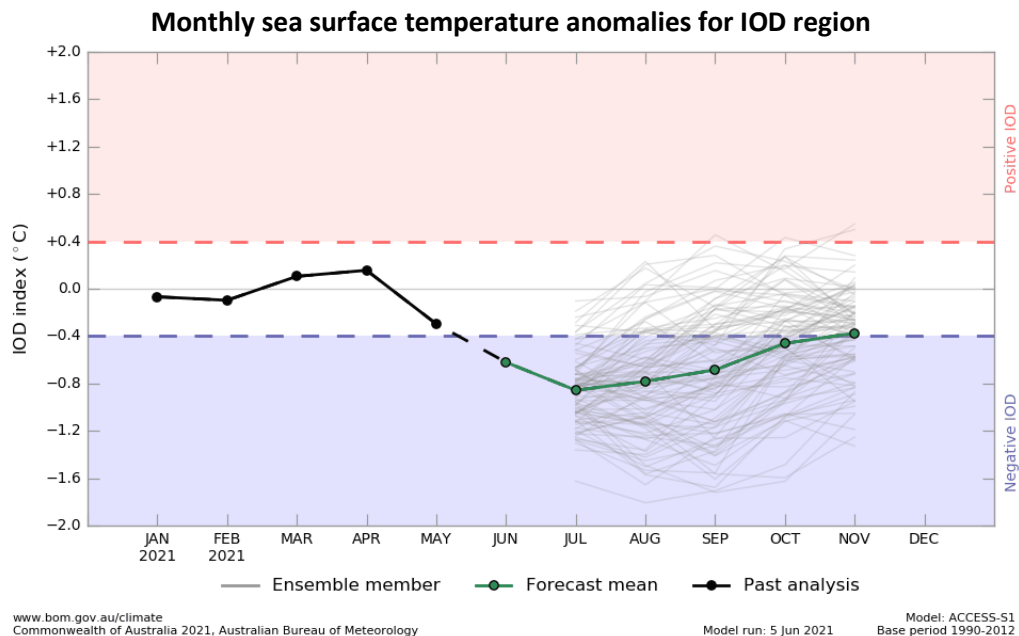




## International climate model outlooks for the NINO 3.4 region in October 2021

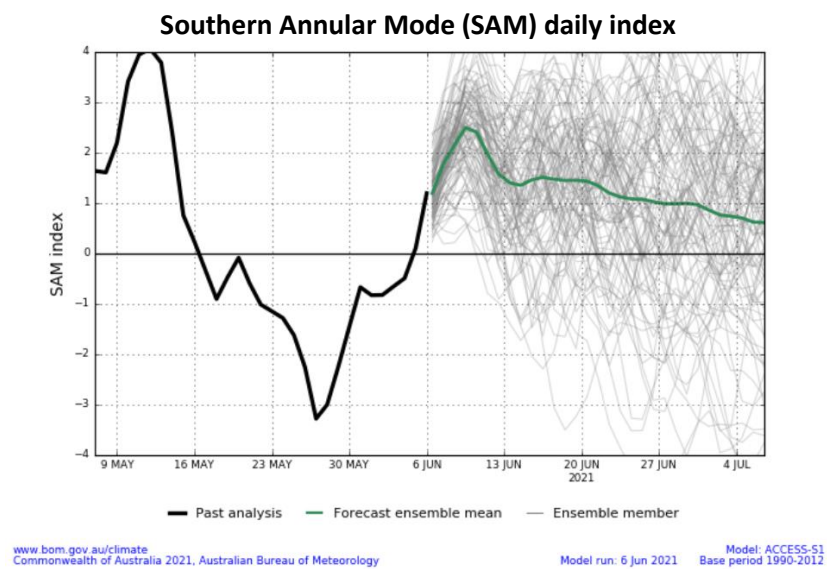


As at 6 June, the Indian Ocean Dipole (IOD) weekly value was  $-0.65^{\circ}\text{C}$ . This is the third consecutive week that the IOD has been below the negative threshold ( $-0.4^{\circ}\text{C}$ ). However, negative IOD values must be sustained for 8 consecutive weeks before a negative IOD event is declared. Forecasts from 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, while four anticipate the IOD remaining neutral. By October, three of the models predict a negative IOD, while the remaining two anticipate neutral IOD conditions. 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 the onset of early northern rainfall.



The Southern Annular Mode (SAM) has recently shifted to positive and is expected to remain positive over the next two weeks, 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 positive SAM in winter is associated with increased rainfall for

parts of eastern Australia. It is also associated with decreased rainfall for western and central Victoria, the south-east of South Australia, the west of Western Australia and Tasmania.



## 1.4. 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.

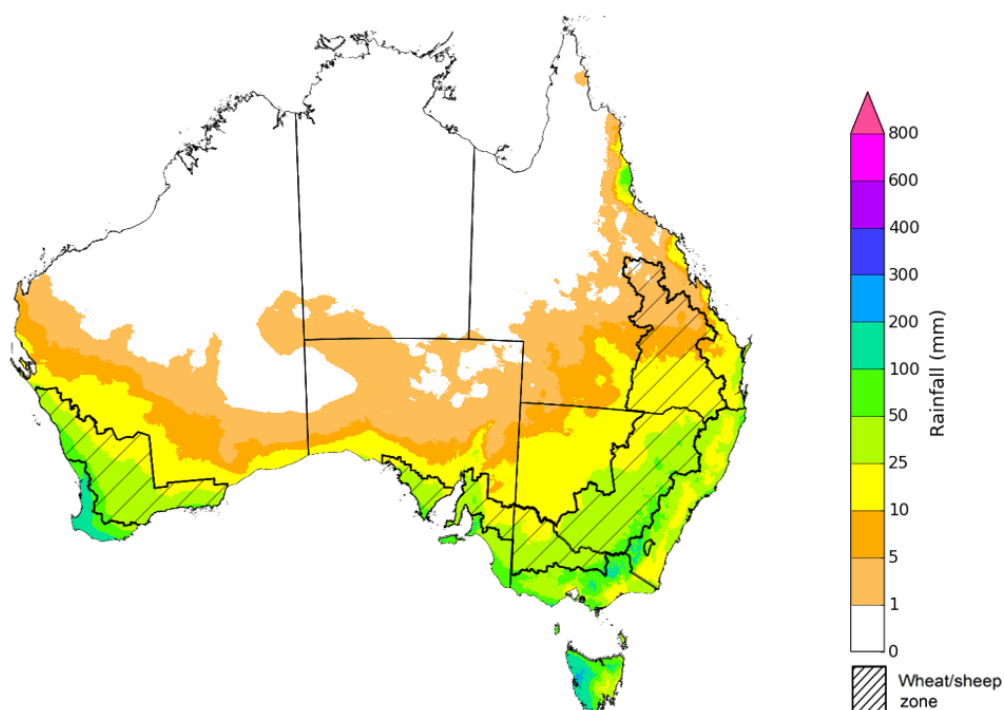
For further information, go to <http://www.bom.gov.au/climate/ahead/about/>

The Bureau of Meteorology's latest rainfall outlook indicated wetter than average conditions are expected for parts of north-western, central and eastern Australia during July. 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 average. 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 July 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 July 2021



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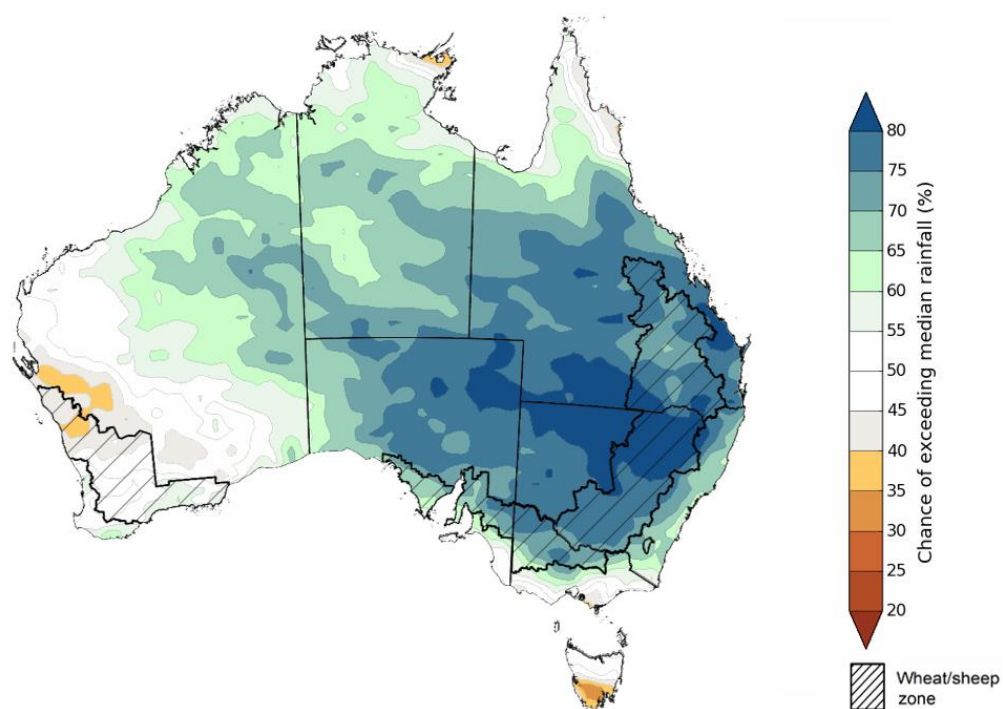
The ACCESS-S climate model suggests there is a 50% chance of exceeding average July rainfall totals across much of southern Australia. There is a 50% chance of 10 to 50 millimetres of rainfall across much of New South Wales, south-eastern Queensland, Victoria, the south of South Australia and the south-west of Western Australia. The forecast rainfalls will add to the above average falls already received and good soil moisture across New South Wales, Queensland and Western Australia. If the forecast rainfalls are to eventuate, they will support the ongoing establishment and growth of winter crops. The cropping regions of western Victoria and eastern South Australia, which have yet to receive substantial opening season rainfall, also have a 50% chance of receiving 10 to 50 millimetres.

These falls are likely to be sufficient to support crop grow if adequate rainfall is received during late June to initiate the germination and establishment of dry-planted crops.

The rainfall outlook for July to September 2021 suggests there is a greater than 75% chance of above average rainfall across much of New South Wales, central and southern Queensland, northern Victoria, South Australia, as well as parts of Western Australia and the Northern Territory. There is a less than 40% chance of exceeding median rainfall across isolated parts of Western Australia and southern Tasmania (Bureau of Meteorology 'National Climate Outlook', 3 June 2021).

Bureau of Meteorology rainfall outlooks for July to September have greater than 55% past accuracy across most of Australia. Outlook accuracy is greater than 65% across much of New South Wales, central and southern Queensland, the north of South Australia and Western Australia, and much of the Northern Territory. On the other hand, there is low past accuracy for isolated parts of northern Queensland and the south of Western Australia.

### Chance of exceeding the median rainfall July to September 2021



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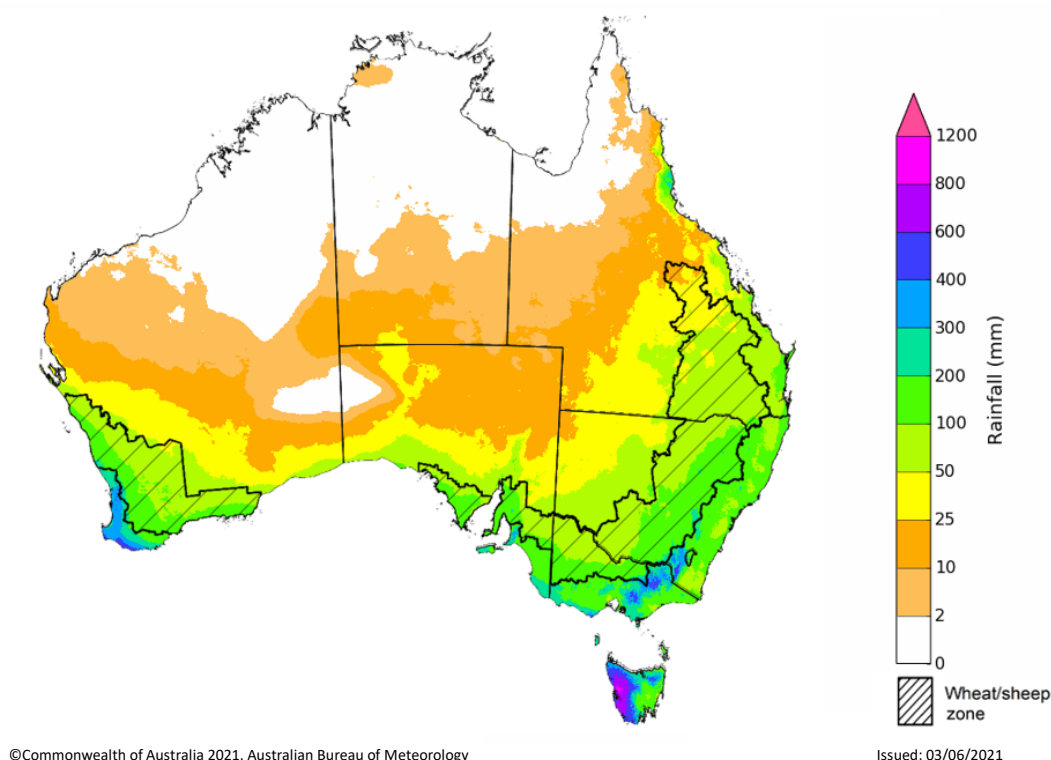


The outlook for July to September suggests there is a 75% chance of rainfall totals between 50 and 200 millimetres across much of New South Wales and Victoria, and parts of south-eastern Queensland, the south of Southern Australia, the south of Western Australia and eastern Tasmania. Rainfall totals in excess of 300 millimetres are likely across parts of alpine regions of New South Wales and Victoria, and the far south-west of Western Australia 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, as well as much of Queensland. Totals of less than 50 millimetres are expected in the northern cropping regions of Queensland.

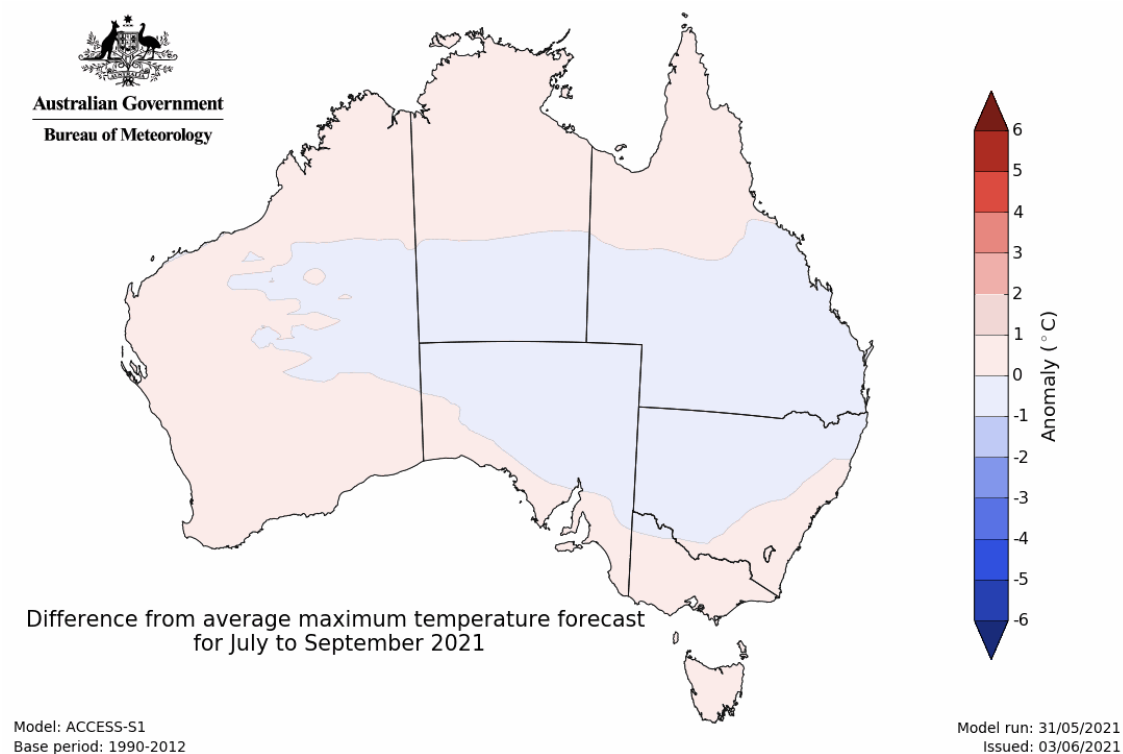
These rainfall totals are average to above average for this three-month period across most cropping regions. Above average soil moisture levels in New South Wales, and parts of Queensland and Western Australia and the probability of close to average in-season rainfall in July to September will assist with maintaining current yield potential in winter crops.

### Rainfall totals that have a 75% chance of occurring July to September 2021

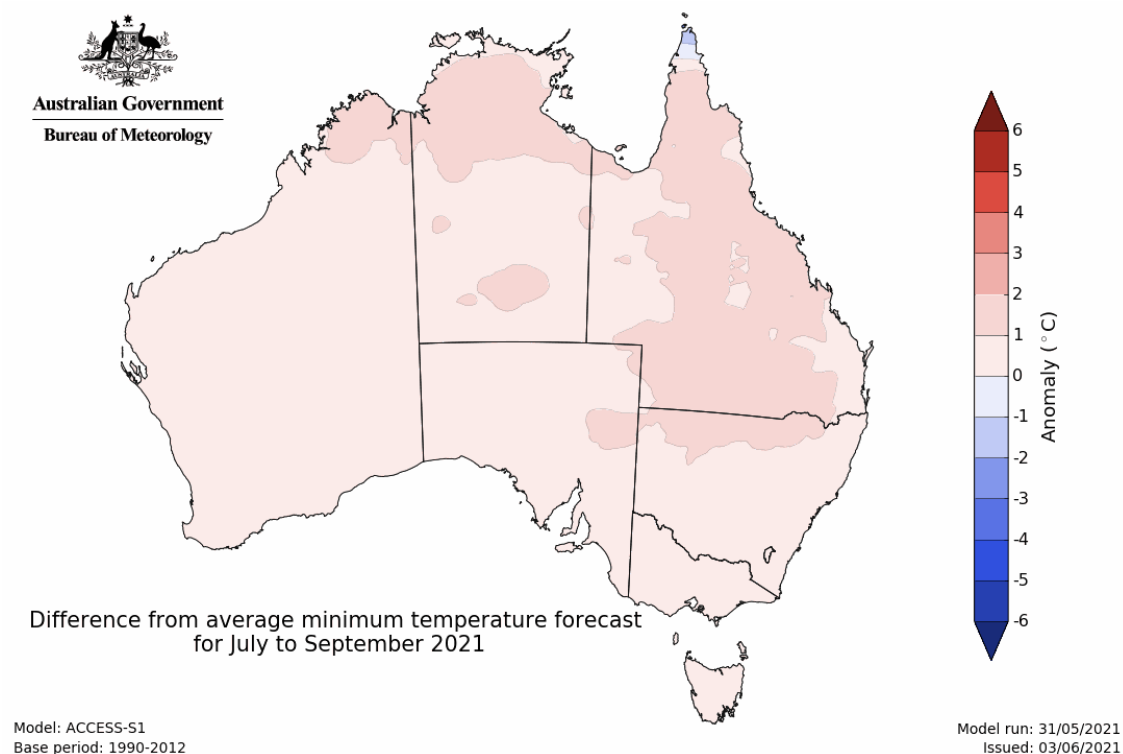


The temperature outlook for July to September 2021 indicates that maximum temperatures across most of Australia are likely to be close to the 1990-2012 average (- 1°C to 1°C). Minimum temperatures are expected to be slightly above average for much of Queensland and parts of Western Australia and the Northern Territory (Bureau of Meteorology 'National Climate Outlook', 7 June 2021).

### Predicted maximum temperature anomaly for July to September 2021



### Predicted minimum temperature anomaly for July to September 2021



## 1.5. Rainfall forecast for the next eight days

Low pressure systems and troughs are likely to bring showers and storms to parts of southern Australia during the 8 days to 17 June 2021. High-pressure systems are expected to keep rainfall totals low for the majority of central and northern Australia during the next 8 days.

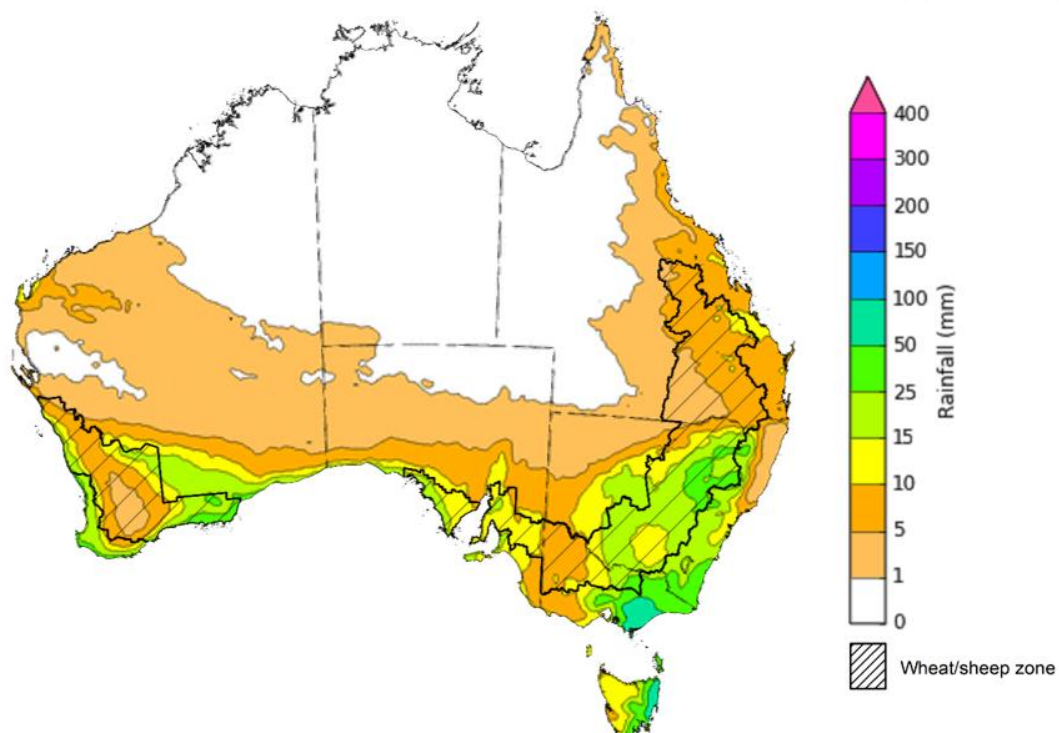
Rainfall totals of between 10 and 50 millimetres are forecast for much of New South Wales and Tasmania, and parts of eastern Victoria, southern South Australia and southern Western Australia. Rainfall in excess of 50 millimetres is forecast for parts of eastern Victoria and eastern Tasmania.

In Australia's cropping regions, rainfall totals of between 10 and 50 millimetres are forecast for much of New South Wales and South Australia and parts of eastern Victoria and Western Australia. Rainfall totals of between 1 and 10 millimetres is expected across cropping regions in northern and eastern Queensland, western Victoria and parts of western and central Western Australian cropping regions.

If realised, the rainfall forecast across many South Australian cropping regions will continue to assist with the germination and establishment of dry sown crops and boost soil moisture. The falls forecast across New South Wales, eastern Victoria and parts of Western Australia will likely support the growth of early sown winter crops and allow farmers to finalise planting programs particularly in southern New South Wales.

The dry forecast for the next 8 days across cropping regions in Queensland and parts of Western Australia will allow for the finalisation of planting programs and the application of fertilizer and post-emergent weed control following this week's rain and facilitate the drying of some waterlogging in southern Victorian and Western Australian growing regions.

**Total forecast rainfall (mm) for the period 10 June to 17 June 2021**



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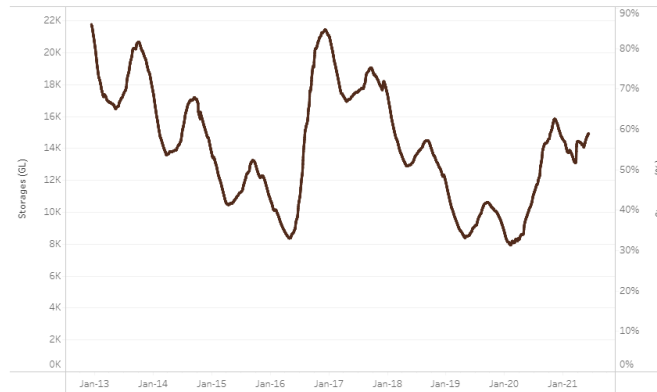
Note: This rainfall forecast is produced from computer models. As the model outputs are not altered by weather forecasters, it is important to check local forecasts and warnings issued by the Bureau of Meteorology.

## 2. Water

### 2.1. Water markets – current week

Water storage in the Murray–Darling Basin (MDB) increased by 100 gigalitres (GL) between 2 June 2021 and 9 June 2021. The current volume of water held in storage is 14,894 GL, which represents 59% of total capacity. This is 45% or 4,597 GL more than at the same time last year.

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

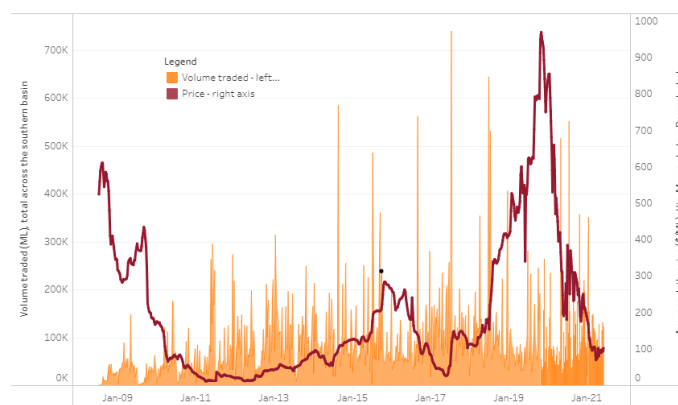


Water storage data is sourced from the Bureau of Meteorology.

Allocation prices in the Victorian Murray below the Barmah Choke increased from \$94 per ML on 28 May 2021 to \$102 per ML on 4 June 2021. Prices are lower in the Murrumbidgee due to the binding of the Murrumbidgee export limit.

Region	\$/ML
NSW Murray Above	97
NSW Murrumbidgee	70
VIC Goulburn-Broken	104
VIC Murray Below	102

**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 10 June 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-100621](http://www.agriculture.gov.au/abares/products/weekly_update/weekly-update-100621)

### 3. Commodities

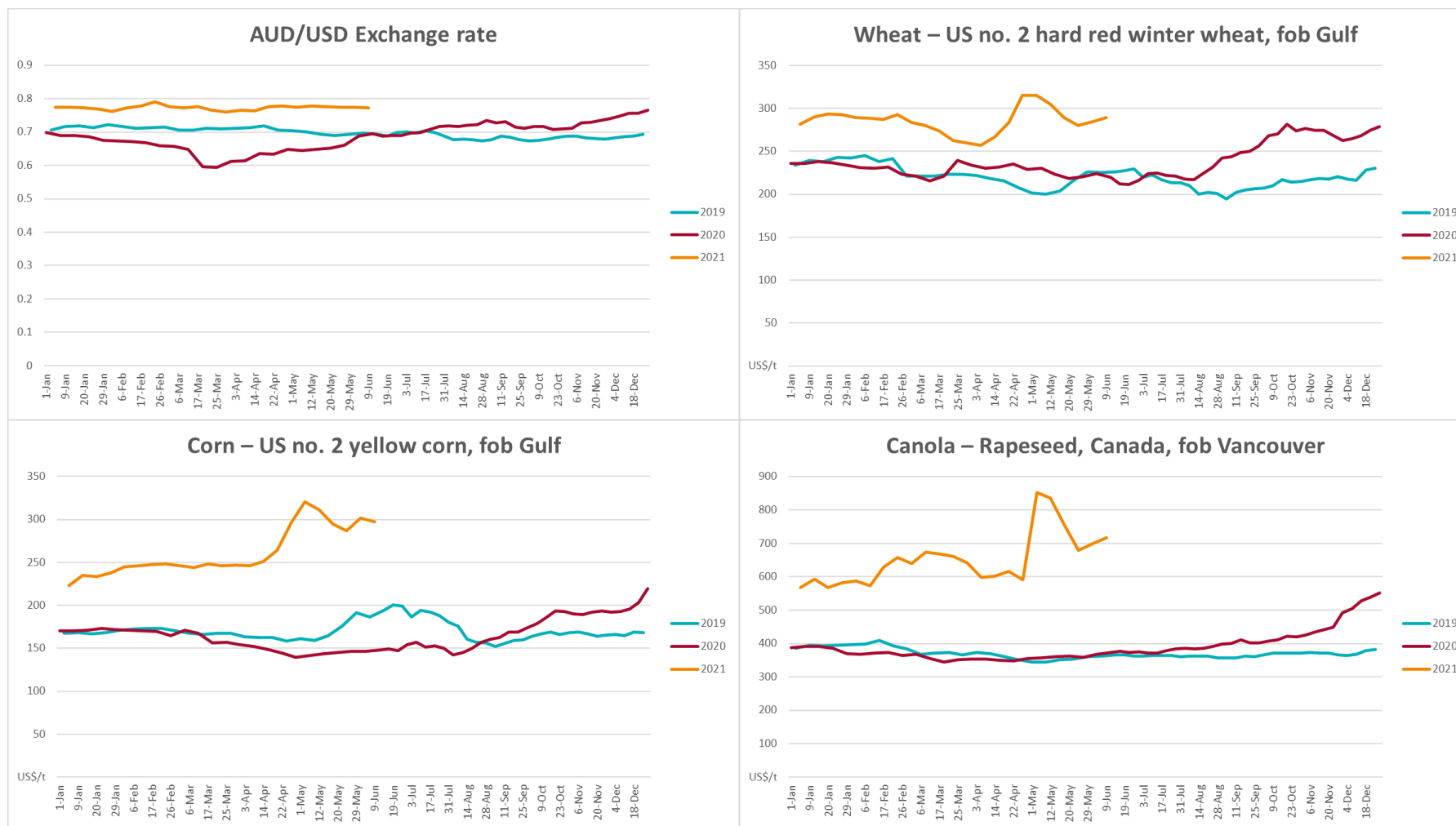
Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
<b>Selected world indicator prices</b>							
AUD/USD Exchange rate	09-Jun	A\$/US\$	0.77	0.77	0%	0.69	12%
Wheat – US no. 2 hard red winter wheat, fob Gulf	09-Jun	US\$/t	290	285	2%	212	37%
Corn – US no. 2 yellow corn, fob Gulf	09-Jun	US\$/t	298	302	-1%	149	99%
Canola – Rapeseed, Canada, fob Vancouver	09-Jun	US\$/t	718	698	3%	376	91%
Cotton – Cotlook 'A' Index	09-Jun	USc/lb	93	90	4%	67	39%
Sugar – Intercontinental Exchange, nearby futures, no.11 contract	09-Jun	USc/lb	18	18	0%	12	45%
Wool – Eastern Market Indicator	09-Jun	Ac/kg clean	1,393	1,343	4%	1,225	14%
Wool – Western Market Indicator	02-Jun	Ac/kg clean	1,385	1,360	2%	1,538	-10%
<b>Selected Australian grain export prices</b>							
Milling Wheat – APW, Port Adelaide, SA	09-Jun	A\$/t	375	377	-1%	315	19%
Feed Wheat – ASW, Port Adelaide, SA	09-Jun	A\$/t	371	371	0%	300	24%
Feed Barley – Port Adelaide, SA	09-Jun	A\$/t	323	315	2%	272	19%
Canola – Kwinana, WA	09-Jun	A\$/t	776	738	5%	631	23%
Grain Sorghum – Brisbane, QLD	09-Jun	A\$/t	375	375	0%	379	-1%
<b>Selected domestic livestock indicator prices</b>							
Beef – Eastern Young Cattle Indicator	09-Jun	Ac/kg cwt	898	891	1%	727	24%
Mutton – Mutton indicator (18–24 kg fat score 2–3), Vic	02-Jun	Ac/kg cwt	679	677	0%	680	0%
Lamb – Eastern States Trade Lamb Indicator	09-Jun	Ac/kg cwt	812	836	-3%	941	-14%
Pig – Eastern Seaboard (60.1–75 kg), average of buyers & sellers	02-Jun	Ac/kg cwt	318	318	0%	406	-22%
Goats – Eastern States (12.1–16 kg)	09-Jun	Ac/kg cwt	869	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

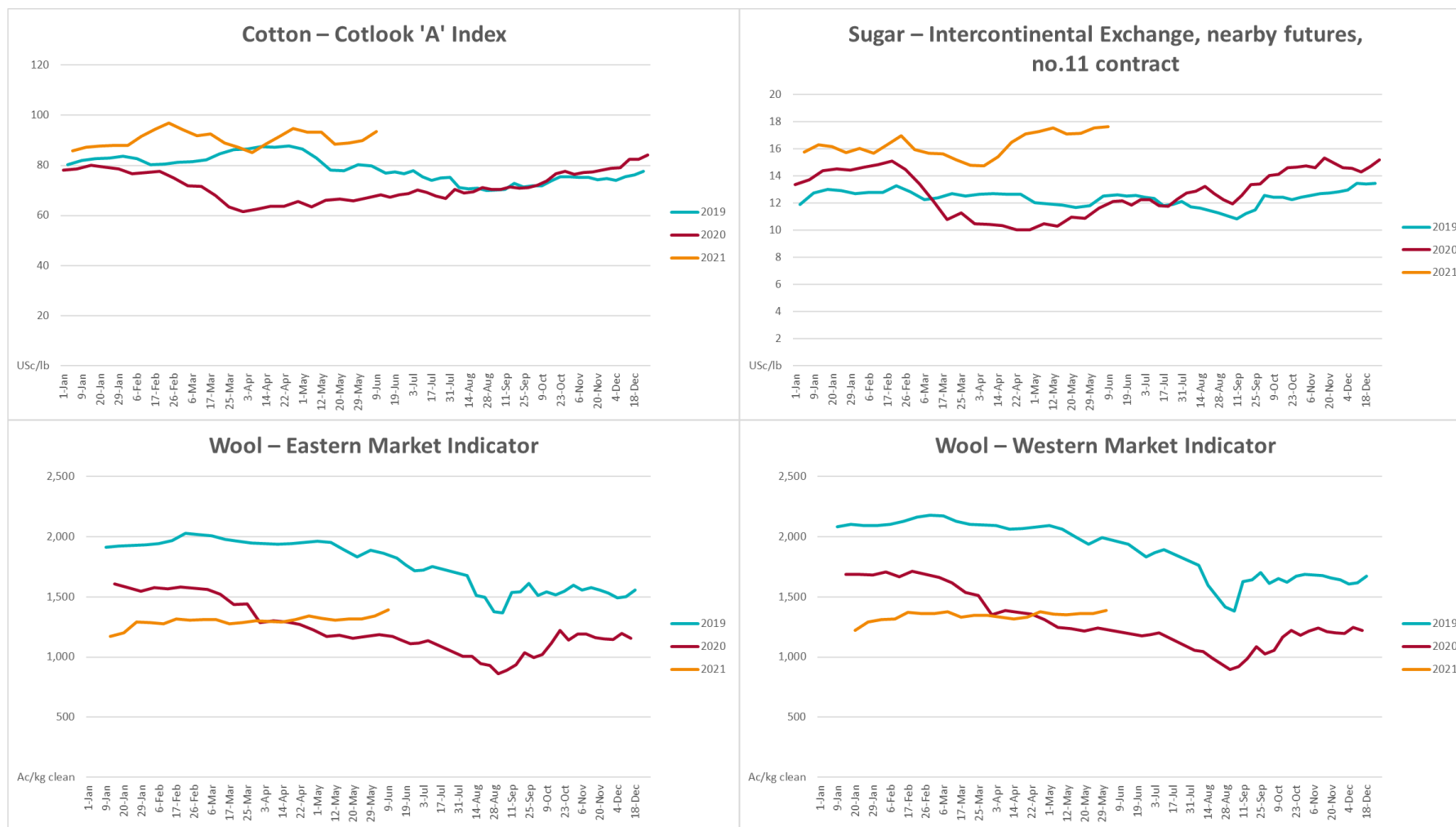


Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
<b>Global Dairy Trade (GDT) weighted average prices <sup>a</sup></b>							
Dairy – Whole milk powder	02-Jun	US\$/t	4,062	4,123	-1%	3,269	24%
Dairy – Skim milk powder	02-Jun	US\$/t	3,415	3,447	-1%	2,462	39%
Dairy – Cheddar cheese	02-Jun	US\$/t	4,324	4,321	0%	4,217	3%
Dairy – Anhydrous milk fat	02-Jun	US\$/t	5,654	5,730	-1%	6,217	-9%

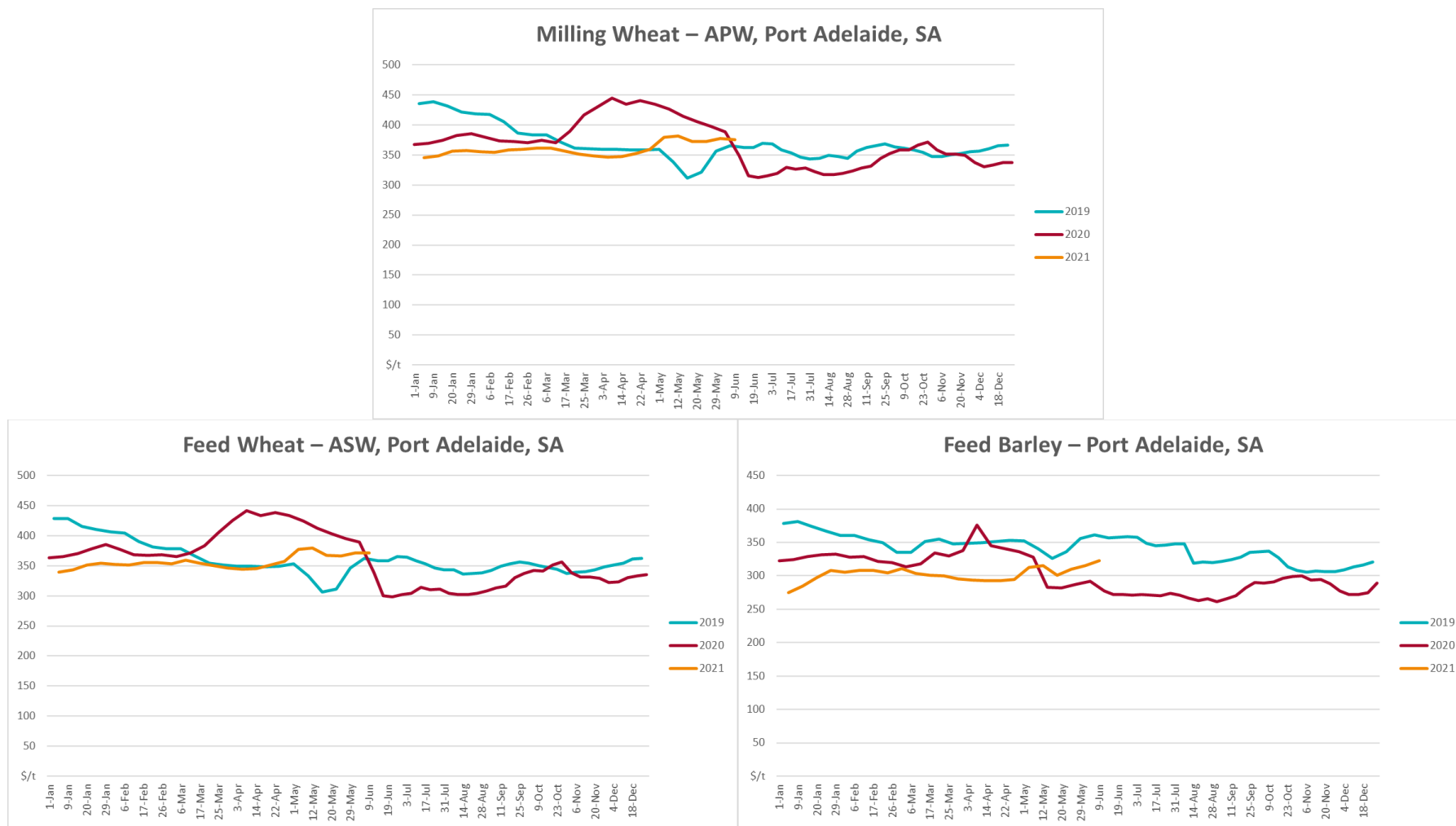
**a** Global Dairy Trade prices are updated twice monthly on the first and third Tuesday of each month.

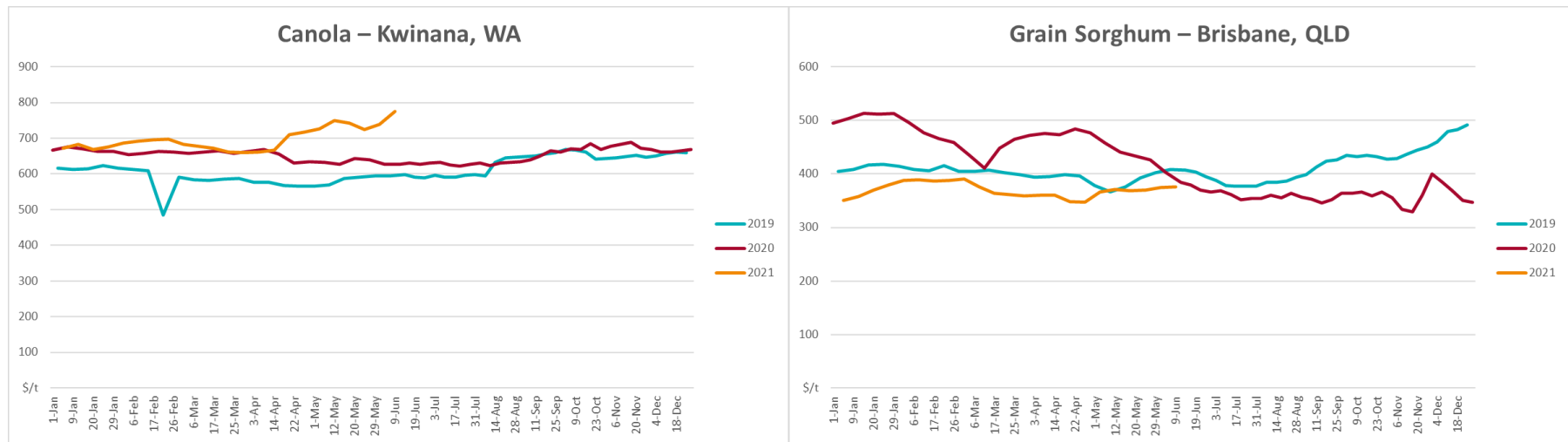
### 3.1. Selected world indicator prices





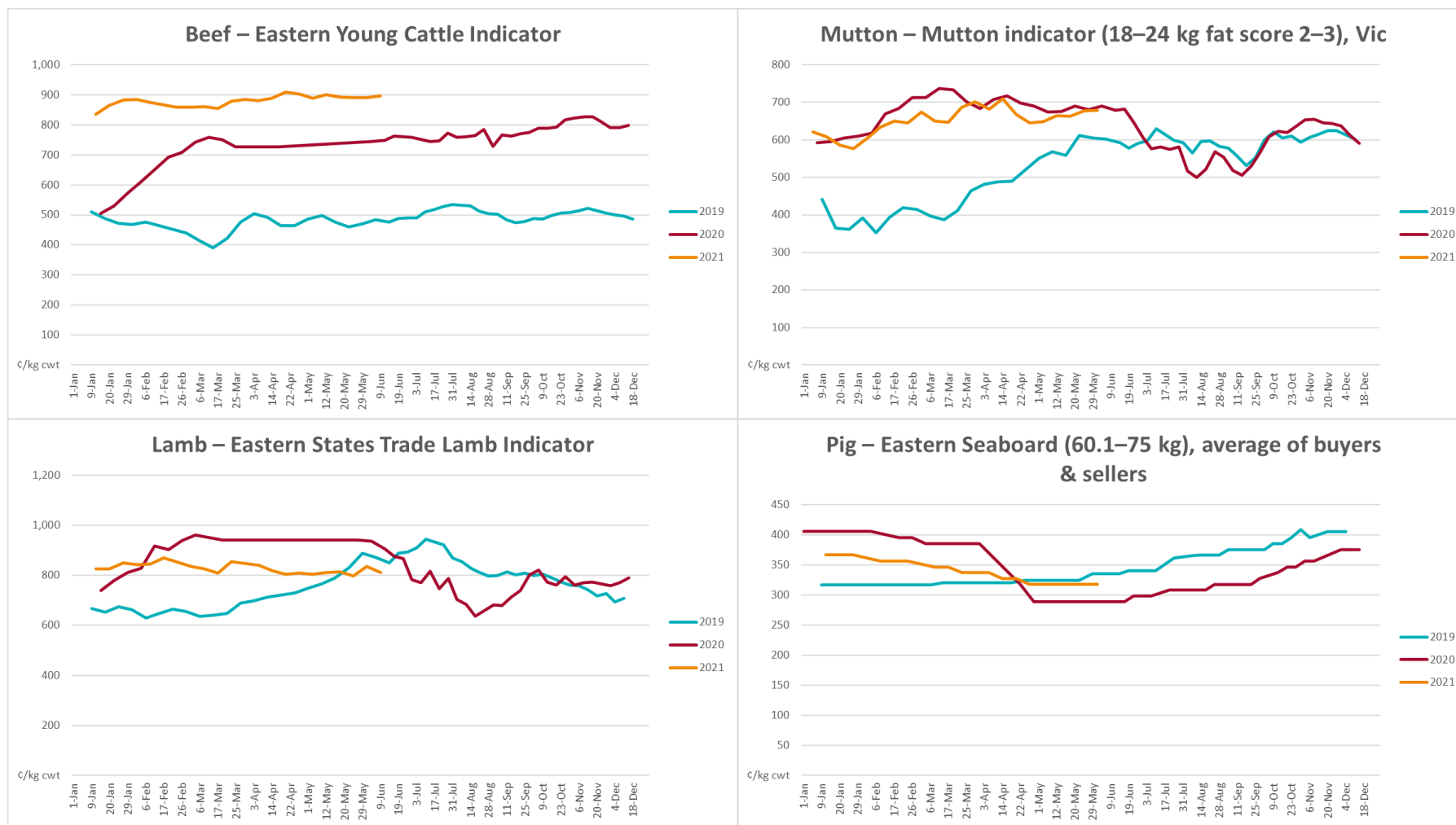
### 3.2. Selected domestic crop indicator prices

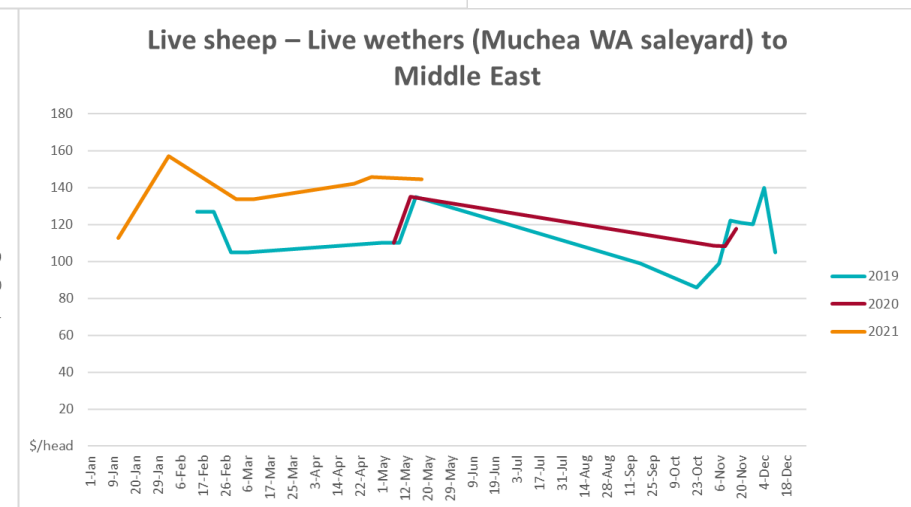
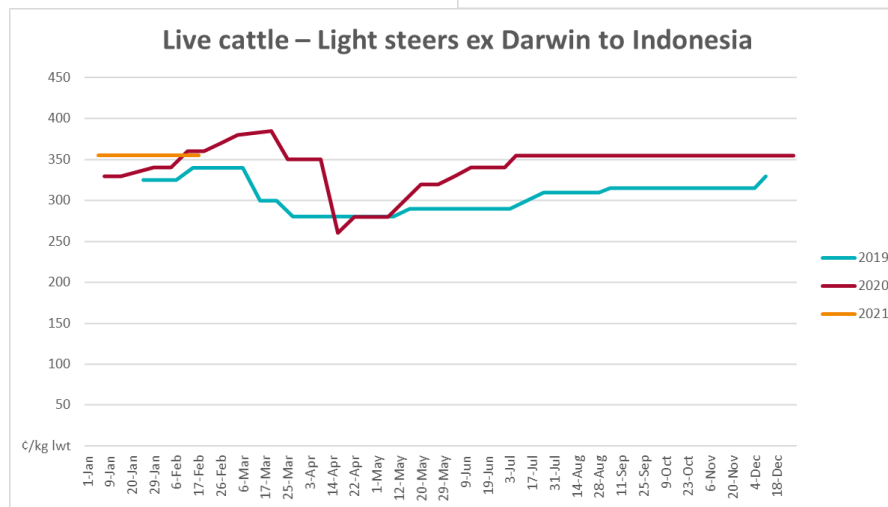
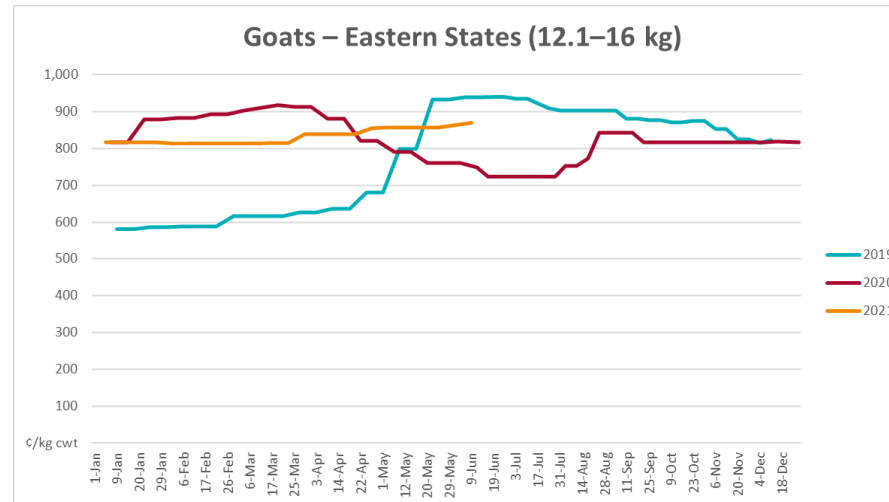




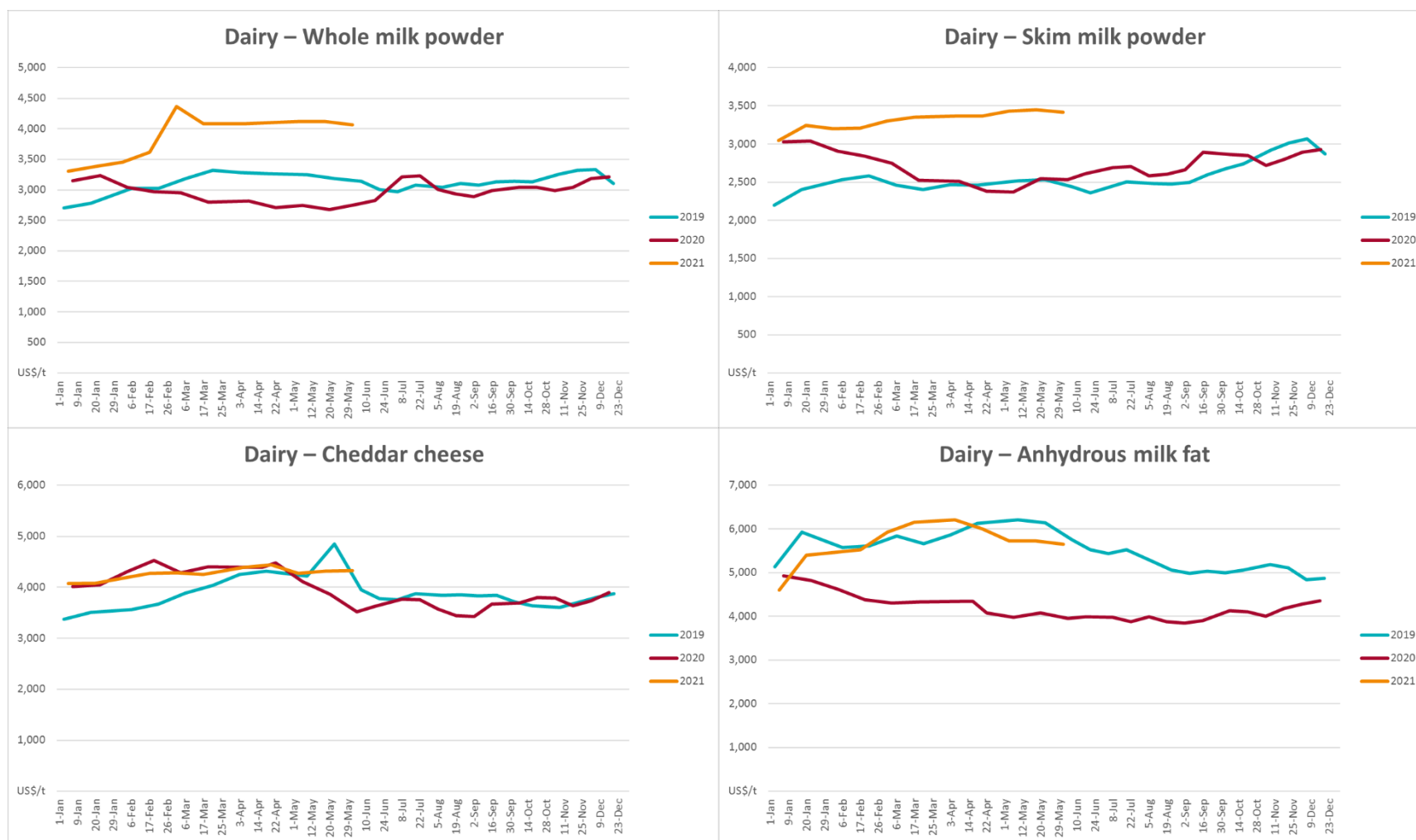


### 3.3. Selected domestic livestock indicator prices

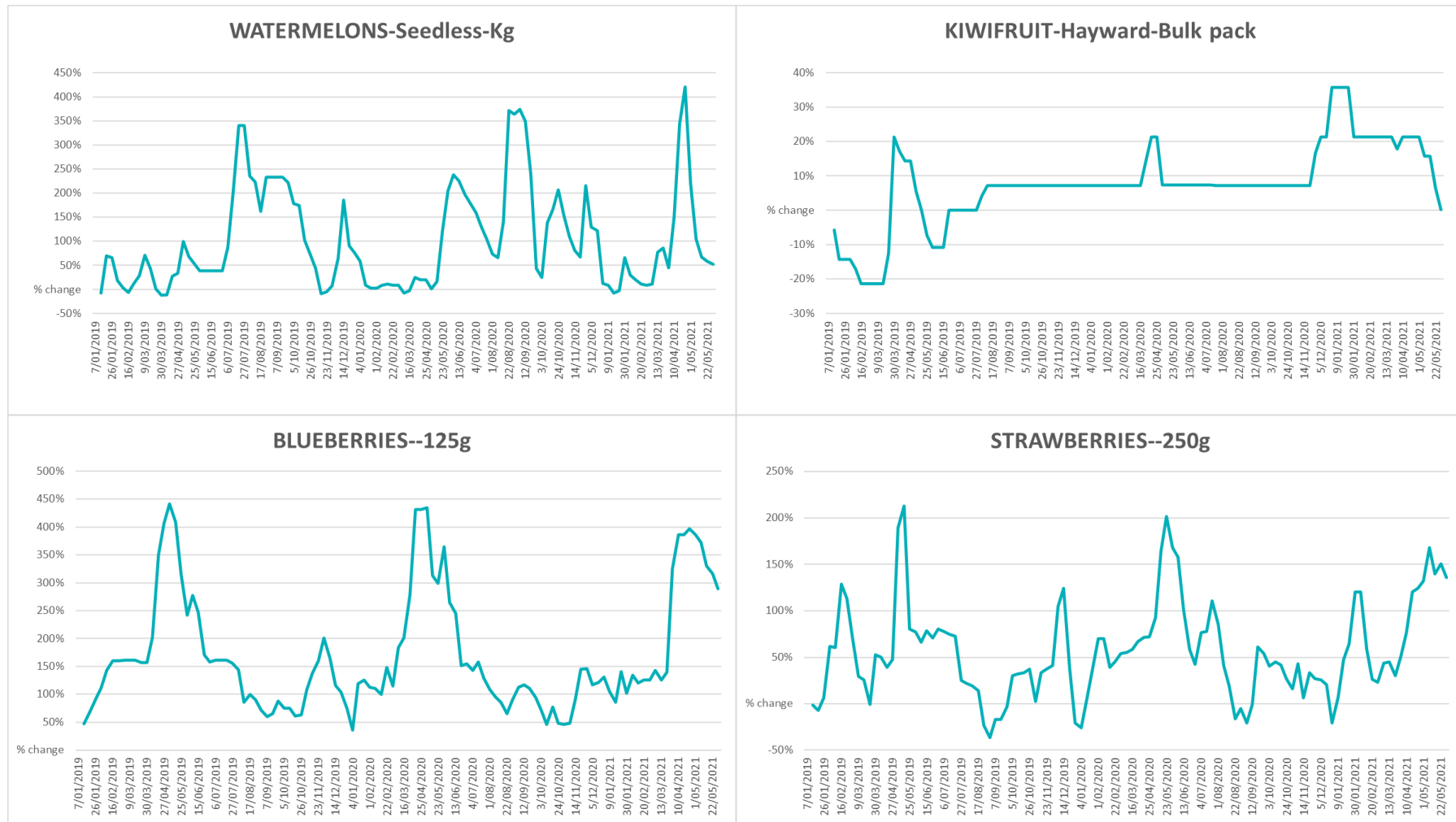


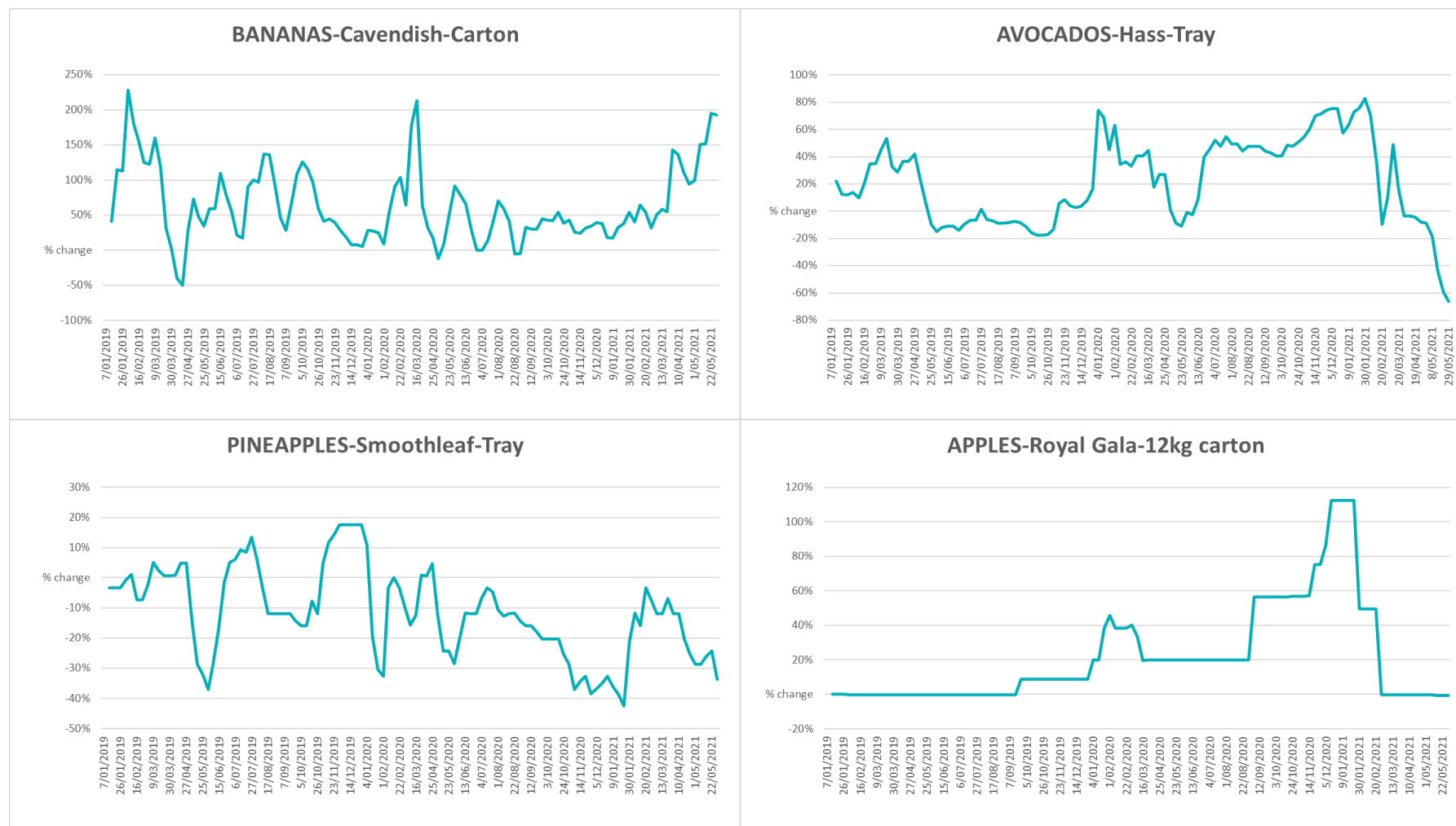


### 3.4. Global Dairy Trade (GDT) weighted average prices

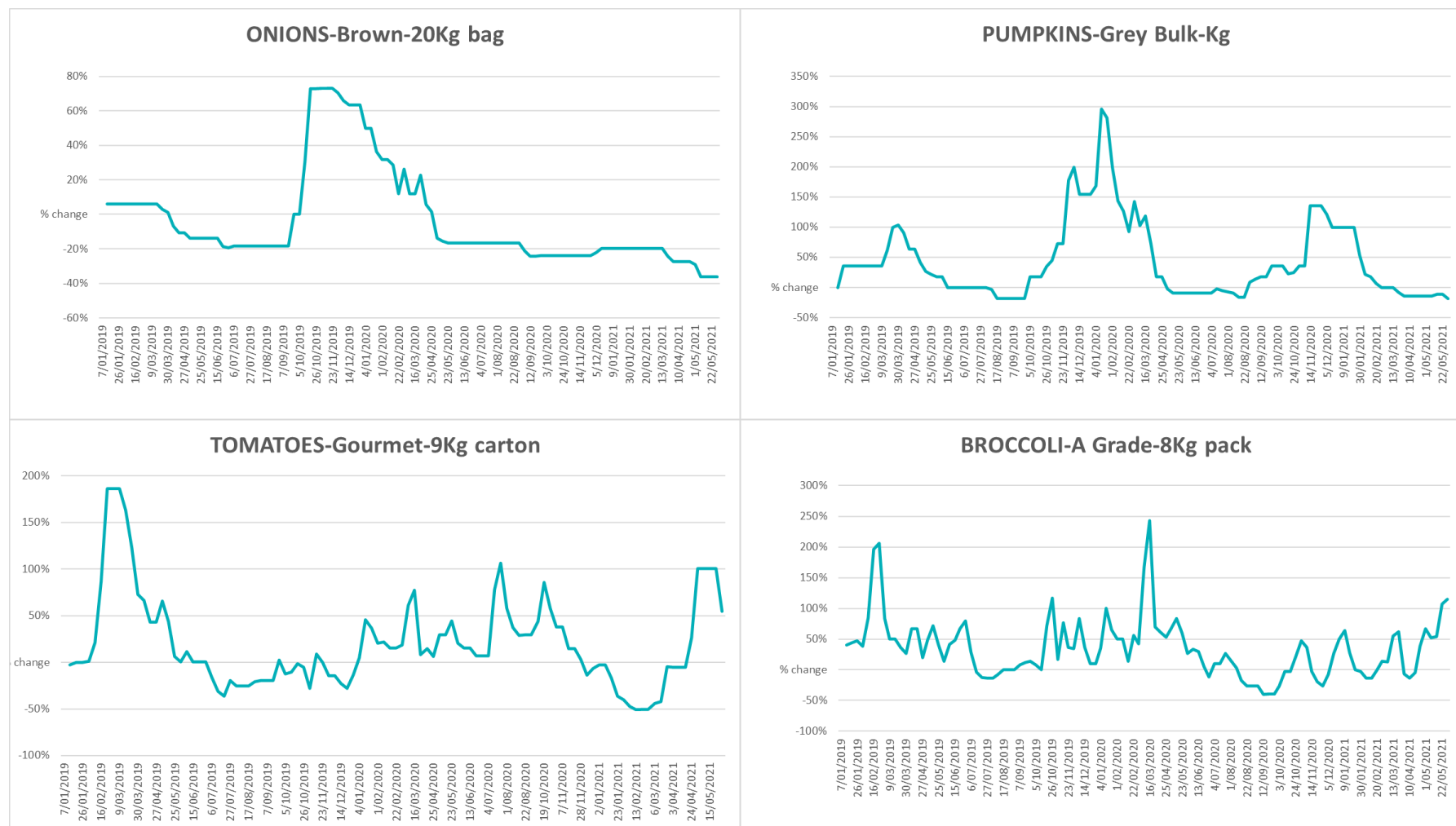


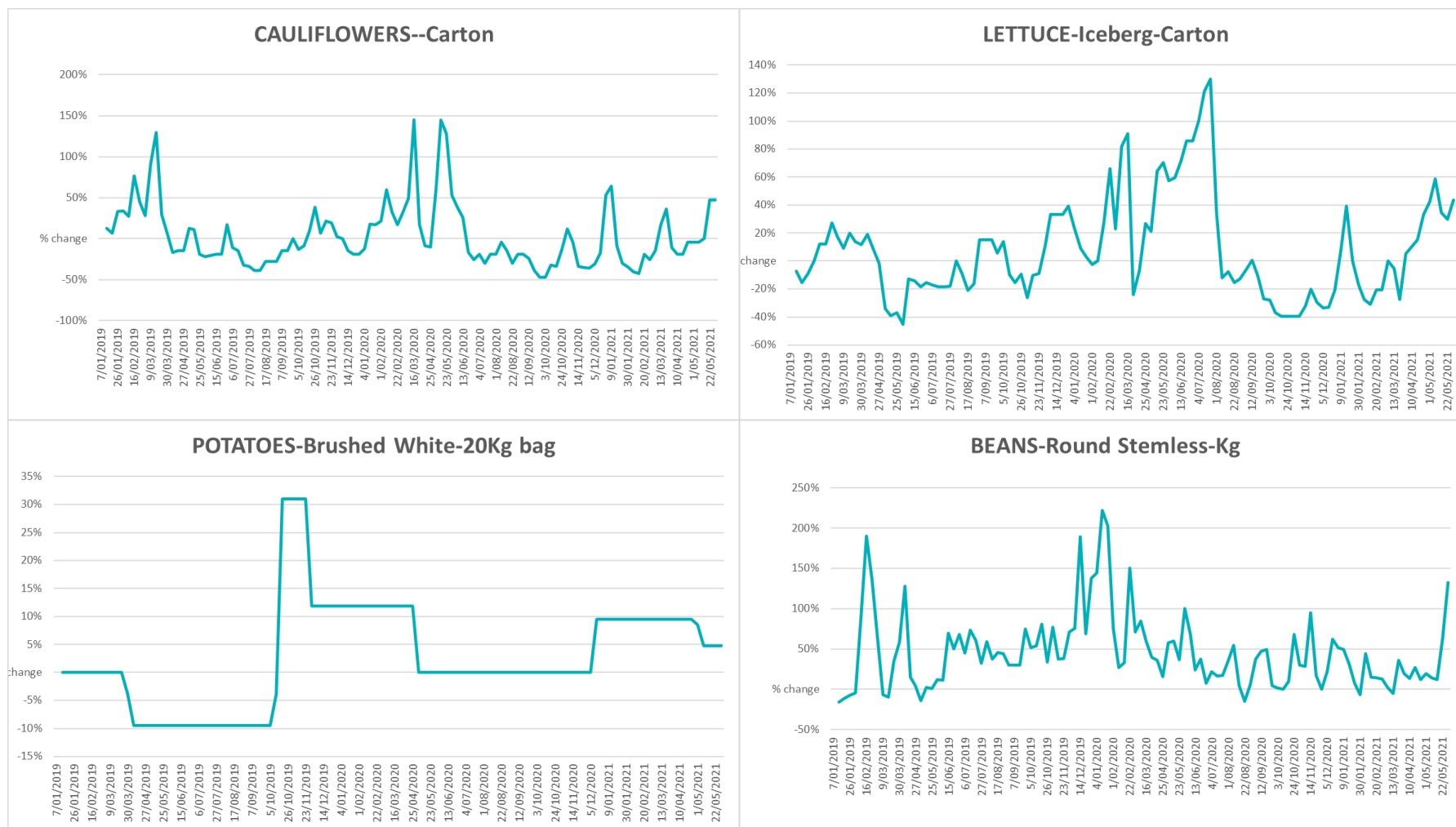
### 3.5. Selected fruit and vegetable prices











## 4. Data attribution

### Climate

#### Bureau of Meteorology

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

#### Other

- Pasture growth: [www.longpaddock.qld.gov.au/aussiegrass/](http://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.watarnsw.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](http://www.freshstate.com.au)

#### Pigs

- Australian Pork Limited: [www.australianpork.com.au](http://www.australianpork.com.au)

#### Dairy

- Global Dairy Trade: [www.globaldairytrade.info/en/product-results/](http://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/](http://www.cotlook.com/)

#### World sugar

- New York Stock Exchange - Intercontinental Exchange

#### Wool

- Australian Wool Exchange: [www.awex.com.au/](http://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](http://www.mla.com.au/Prices-and-market)

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