

Weekly Australian Climate, Water and Agricultural Update



No. 26/2021

8 July 2021

Summary of key issues

- During the week ending 7 July 2021, low pressure troughs and cold fronts brought moderate rainfall to parts of eastern, south-eastern and south-western Australia (see Section 1.1).
- The rainfall across some south-eastern Australian cropping regions has provided much needed
 moisture to parts of central and western South Australia to assist with winter crop germination and
 establishment. However, cropping regions with below average soil moisture in north-western
 Victoria and eastern South Australia recorded little rainfall to assist with winter crop germination
 and establishment.
- Nationally, pasture growth conditions during the 3-months to June 2021 were above average across large areas of eastern and western 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 rainfall over the remainder of winter to build soil moisture levels and supplementary feeding to maintain current stock numbers (see Section 1.2).
- A negative Indian Ocean Dipole (IOD) event is looking increasingly likely if current conditions in the Indian Ocean persist. The Southern Annular Mode (SAM) has also recently shifted to positive values. Given current and expected conditions, the IOD and SAM are likely to enhance winter rainfall across parts of Australia (see Section 1.3).
- The rainfall outlook for August to October 2021 suggests there is a greater than 75% chance of above average rainfall across much of New South Wales, Queensland, northern Victoria, South Australia, as well as parts of Western Australia. If realised this forecast is likely to result in average to above average rainfall totals for most cropping regions and support the ongoing establishment and growth, and eventual yield development, of winter crops (see Section 1.4).
- Low pressure systems and troughs are likely to bring showers and storms to parts of south-eastern and south-western Australia during the 8 days to 15 July 2021.
- In the next eight days, rainfall totals of between 10 and 50 millimetres are forecast for cropping regions across much of New South Wales and Western Australia, and parts of southern South Australia, Victoria, and Queensland. If realised, the falls forecast across New South Wales, southern Victoria, southern Queensland, and Western Australia will likely support the growth of early sown winter crops. However, further rainfall is likely to exacerbate the effects of waterlogging in some southern Victorian and Western Australian growing regions (see Section 1.5).
- Water storage in the Murray-Darling Basin (MDB) increased by368 gigalitres (GL) between
 29 June 2021 and 6 July 2021. The current volume of water held in storage is 16,508 GL, which represents 65% of total capacity. This is 47% or 5,234 GL more than at the same time last year.
- Allocation prices in the Victorian Murray below the Barmah Choke decreased from \$96 per ML on 27 June 2021 to \$90 per ML on 30 June 2021. Prices are lower in the Murrumbidgee due to the binding of the Murrumbidgee export limit.

1. Climate

1.1. Rainfall this week

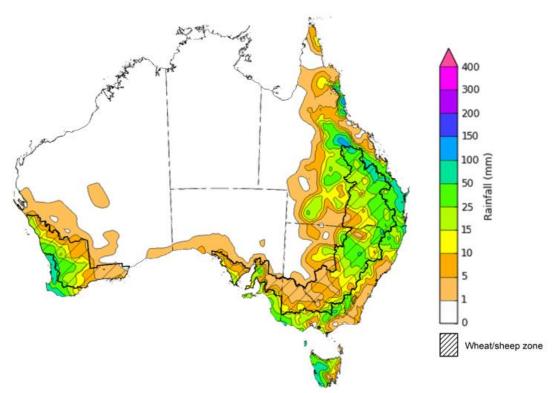
During the week ending 7 July 2021, low pressure troughs and cold fronts brought moderate rainfall to parts of eastern, south-eastern and south-western Australia. High pressure systems restricted rainfall across the remainder of Australia.

Rainfall totals of between 10 and 50 millimetres were recorded across parts of New South Wales and Victoria, eastern Queensland, the far south of South Australia, the southwest of Western Australia and much of Tasmania. Rainfall totals in excess of 50 millimetres were recorded across isolated parts of north-eastern New South Wales, central and eastern Queensland, eastern Victoria, the far southwest of Western Australia 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, Queensland, parts of eastern and southern Victoria, and western and central South Australia and western and central Western Australia. Little to no rainfall was recorded across remaining cropping regions in southern New South Wales, northern Victoria and eastern South Australia during the week ending 7 July 2021.

The rainfall across some south-eastern Australian cropping regions has provided much needed moisture to parts of central and western South Australia to assist with winter crop germination and establishment. This rainfall will also support the development of established crops in much of New South Wales and Queensland. Cropping regions with below average soil moisture in north-western Victoria and eastern South Australia recorded little rainfall to assist with winter crop germination and establishment.

Rainfall for the week ending 7 July 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 <u>quality control</u>. 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 https://www.bom.gov.au/climate/rainfall/

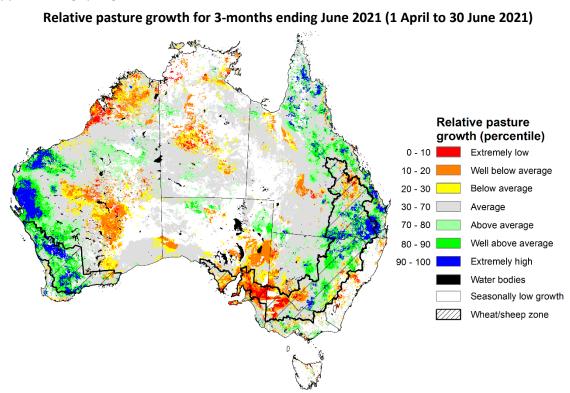
1.2. Pasture growth

Pasture growth during the April to June period affects the availability of fodder to support livestock production across northern Australia as it enters a seasonally low growth period. Across southern Australia, April to June pasture growth influences the amount of plant biomass that is available to support livestock production over the low growth months of winter and the level of reliance on hay and grain during this period.

For the 3 months to June 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 rainfall and generally average soil moisture benefitted pasture production across parts of western and eastern Australia.

Modelled pasture growth was extremely low to below average across parts of south-western New South Wales, parts of western and central Queensland, western Victoria, south-eastern South Australia, central and northern Western Australia, and parts of central Northern Territory. As a result, livestock producers in across parts of south-western New South Wales, western Victoria and south-eastern South Australia will be heavily reliant on rainfall over the remainder of winter 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, eastern Queensland, and large areas of Western Australia. This growth is likely to enable farmers to continue to rebuild stock numbers and provide opportunities to replenish fodder supplies during spring.



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 5km2 grid cells.

Source: Queensland Department of Science, Information Technology and Innovation

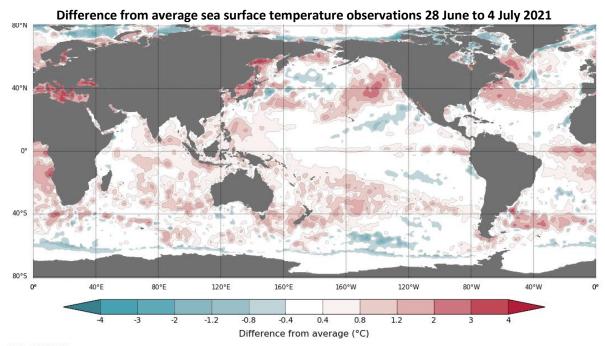
1.3. Climate Drivers

Throughout the late winter and early spring period 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. International climate models expect the ENSO to remain neutral throughout winter, with two of the seven models predicting the development of a La Niña event in late spring. Meanwhile, sea surface temperatures in the tropical Indian Ocean suggest the continued development of a negative IOD event. The SAM became strongly positive over the preceding couple of weeks. Given current and expected conditions, the IOD and SAM are likely to be the major influences on late winter and early spring rainfall across Australia.

Sea surface temperature anomalies have been close to average across the tropical Pacific Ocean over the previous week. There has been an increase in warm anomalies in the western Pacific, the Maritime continent and along the east coast of Australia. Neutral Pacific equatorial sea surface temperatures are associated with neutral ENSO conditions.

Warm sea surface temperature anomalies have contracted slightly near Western Australia and Indonesia. Meanwhile, sea surface temperatures in the western Indian Ocean remained neutral over the past week. The warm anomalies in the eastern Indian Ocean and the ocean surrounding Australia underpin the ongoing development of a potential negative IOD.

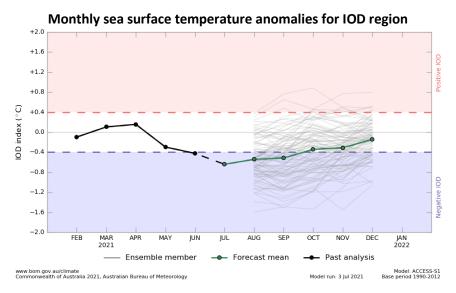


Data: BOM SST Climatology baseline: 1961 to 1990 © Commonwealth of Australia 2021, Australian Bureau of Meteorology

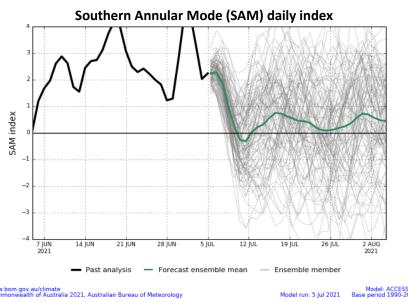
http://www.bom.gov.au/climate

Weekly average: 4 July 2021 Created: 05/07/2021 A negative IOD event is looking increasingly likely 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 is associated with above average rainfall across southern Australia throughout winter and spring, as well as the far north. It is also associated with the onset of early northern rainfall.

As at 4 July 2021, the Indian Ocean Dipole (IOD) weekly value was -0.27°C. The IOD index has been below the negative IOD threshold (-0.4 °C) for six consecutive weeks prior to this week. While a negative IOD event is not declared until the index has been below the threshold for at least 8 weeks, this pattern can still influence Australian rainfall as the event develops. Forecasts from international climate models surveyed by the Bureau of Meteorology have mixed expectations for the months ahead. Two of the five models predict a negative IOD in July, while three anticipate the IOD remaining neutral. By September, all five models predict a negative IOD, but only one models anticipate the negative IOD to remain until November.



The Southern Annular Mode (SAM) is strongly positive at present, but is expected to return to neutral values and remain neutral over the coming weeks. 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/

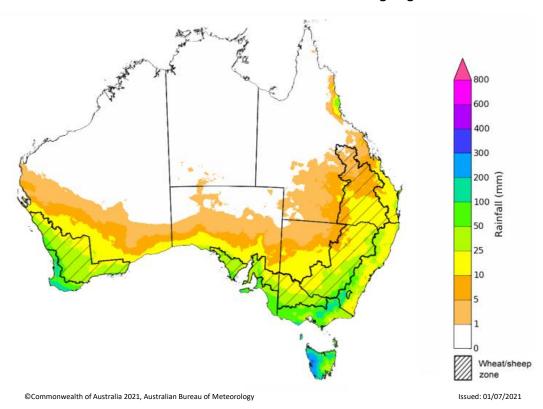
The Bureau of Meteorology's latest rainfall outlook indicated wetter than average conditions are expected for much of northern, central and eastern Australia during August. It should be noted that May marked the beginning of the northern Australian dry season. This means tropical northern Australia typically 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 August 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 northern 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. If the forecast rainfalls are to eventuate, they will support the ongoing establishment and growth, and eventual yield development, of winter crops.

The cropping regions of western Victoria and eastern South Australia, with below average soil moisture, also have a 75% chance of receiving 10 to 25 millimetres. These falls are likely to be sufficient to support crop grow if adequate rainfall is received during July to initiate the germination and establishment of dry-planted crops.

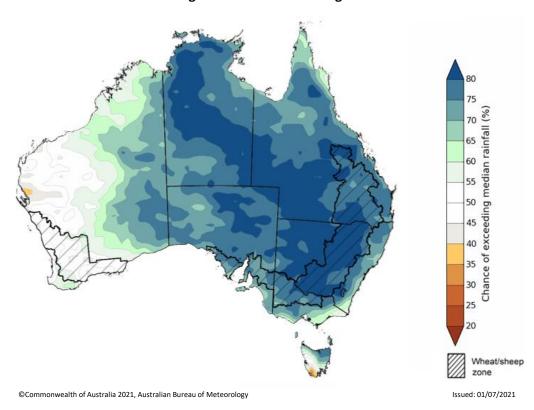
Rainfall totals that have a 75% chance of occurring August 2021



The rainfall outlook for August to October 2021 suggests there is a greater than 75% chance of above average rainfall across much of New South Wales, 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', 1 July 2021).

Bureau of Meteorology rainfall outlooks for August to October 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, South Australia, Western Australia, and much of the Northern Territory.

Chance of exceeding the median rainfall August to October 2021

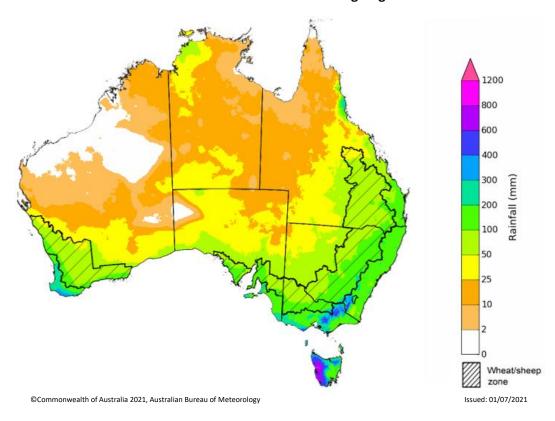


The outlook for August to October suggests there is a 75% chance of rainfall totals between 50 and 200 millimetres across much of New South Wales and Victoria, and parts of south-eastern Queensland, the south of Southern Australia, the south of Western Australia and eastern Tasmania. Rainfall totals 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 far northern cropping regions of Queensland.

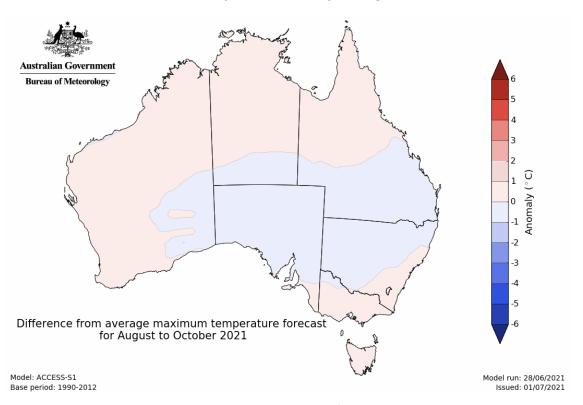
These rainfall totals are average to above average for this three-month period across most cropping regions. Above average soil moisture levels in New South Wales, and parts of Queensland and Western Australia and the probability of close to average in-season rainfall in August to October will assist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

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

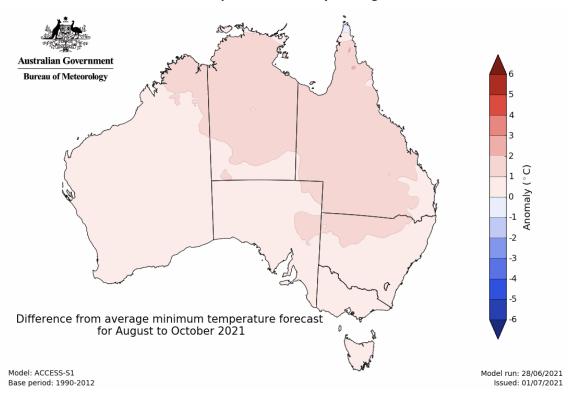


The temperature outlook for August to October 2021 indicates that maximum temperatures across most of Australia are likely to be close to the 1990-2012 average (- 1°C to 1°C). Minimum temperatures are expected to be slightly above average for much of Queensland and parts of northern New South Wales,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

Predicted maximum temperature anomaly for August to October 2021



Predicted minimum temperature anomaly for August to October 2021



1.5. Rainfall forecast for the next eight days

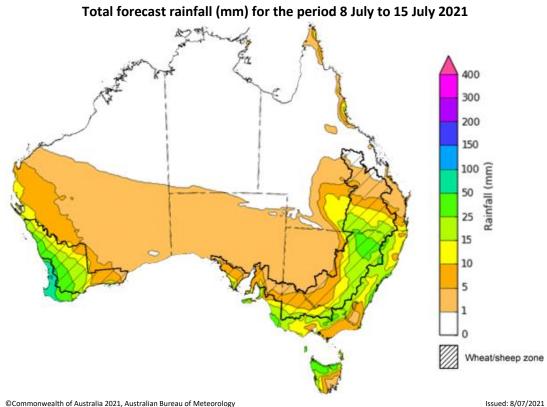
Low pressure systems and troughs are likely to bring showers and storms to parts of south-eastern and south-western Australia during the 8 days to 15 July 2021. High-pressure systems are expected to keep rainfall totals low for the majority of central and northern Australia during the next 8 days.

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

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

If realised, the falls forecast across New South Wales, southern Victoria, southern Queensland, and Western Australia will likely support the growth of early sown winter crops.

The dry forecast for the next 8 days across cropping regions in northern Queensland, southern New South Wales and parts of South Australia and 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. However further rainfall is likely to exacerbate the effects of waterlogging in some southern Victorian and Western Australian growing regions.



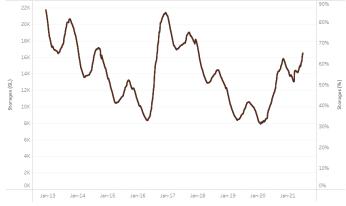
Note: This rainfall forecast is produced from computer models. As the model outputs are not altered by weather forecasters, it is important to check local forecasts and warnings issued by the Bureau of Meteorology.

2. Water

2.1. Water markets – current week

Water storage in the Murray—Darling Basin (MDB) increased by 368 gigalitres (GL) between 29 June 2021 and 6 July 2021. The current volume of water held in storage is 16,508 GL, which represents 65% of total capacity. This is 47% or 5,234 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 decreased from \$96 per ML on 27 June 2021 to \$90 per ML on 30 June 2021. Prices are lower in the Murrumbidgee due to the binding of the Murrumbidgee export limit.

Region	\$/ML
NSW Murray Above	94
NSW Murrumbidgee	87
VIC Goulburn-Broken	97
VIC Murray Below	90

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 8 July 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-080721

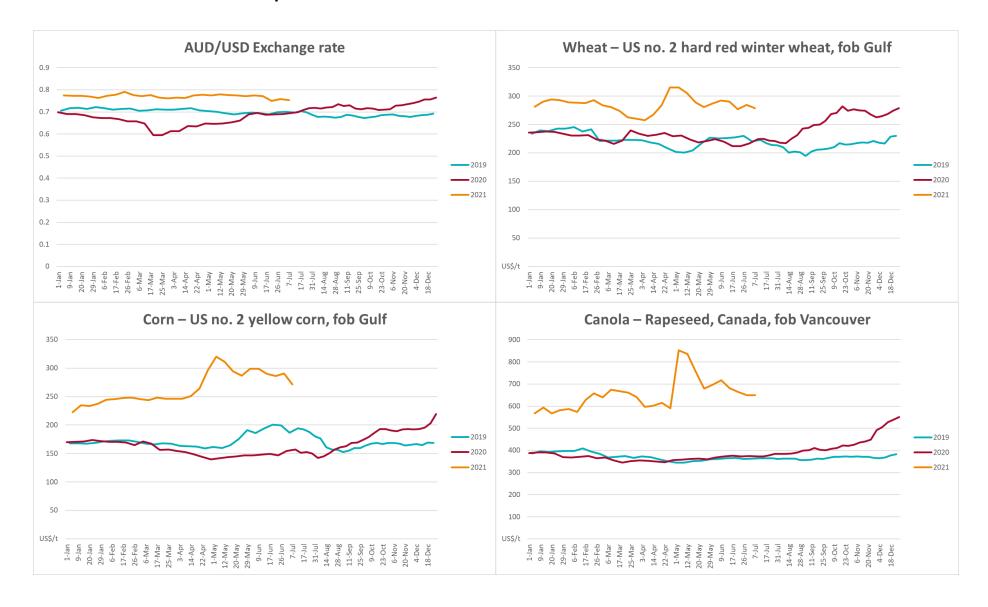
3. Commodities

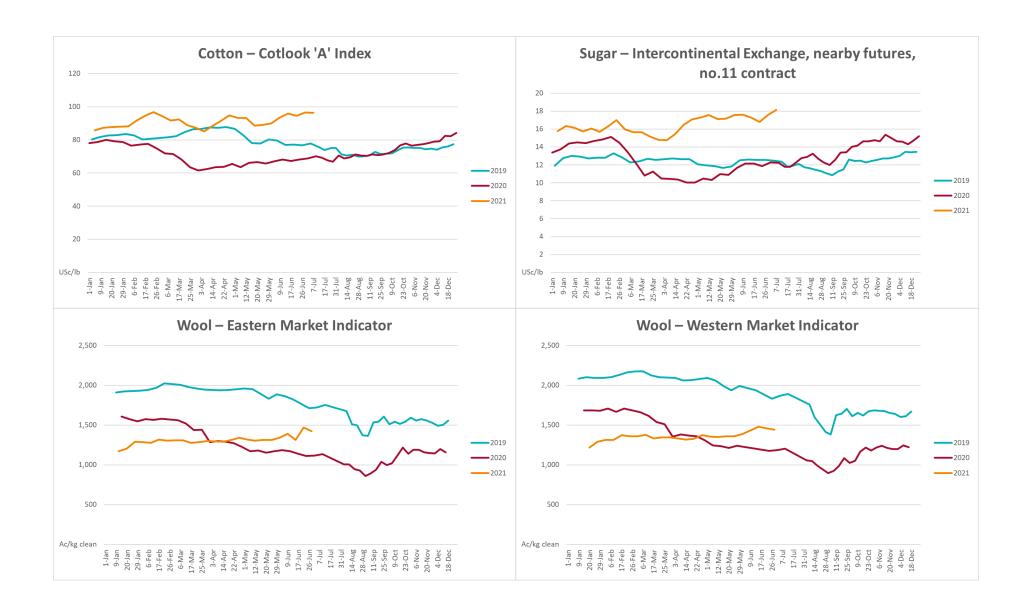
Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
Selected world indicator prices							
AUD/USD Exchange rate	07-Jul	A\$/US\$	0.75	0.76	-1%	0.70	8%
Wheat – US no. 2 hard red winter wheat, fob Gulf	07-Jul	US\$/t	279	284	-2%	225	24%
Corn – US no. 2 yellow corn, fob Gulf	07-Jul	US\$/t	271	291	-7%	151	80%
Canola – Rapeseed, Canada, fob Vancouver	07-Jul	US\$/t	649	649	0%	372	74%
Cotton – Cotlook 'A' Index	07-Jul	USc/lb	96	96	0%	69	39%
Sugar – Intercontinental Exchange, nearby futures, no.11 contract	07-Jul	USc/lb	18.1	17.6	3%	12	54%
Wool – Eastern Market Indicator	30-Jun	Ac/kg clean	1,423	1,468	-3%	1,155	23%
Wool – Western Market Indicator	30-Jun	Ac/kg clean	1,440	1,477	-3%	1,353	6%
Selected Australian grain export prices							
Milling Wheat – APW, Port Adelaide, SA	07-Jul	A\$/t	381	376	1%	330	16%
Feed Wheat – ASW, Port Adelaide, SA	07-Jul	A\$/t	376	372	1%	315	20%
Feed Barley – Port Adelaide, SA	07-Jul	A\$/t	326	329	-1%	271	20%
Canola – Kwinana, WA	07-Jul	A\$/t	740	733	1%	624	19%
Grain Sorghum – Brisbane, QLD	07-Jul	A\$/t	373	376	-1%	361	3%
Selected domestic livestock indicator prices							
Beef – Eastern Young Cattle Indicator	07-Jul	Ac/kg cwt	948	937	1%	763	24%
Mutton – Mutton indicator (18–24 kg fat score 2–3), Vic	07-Jul	Ac/kg cwt	691	687	1%	607	14%
Lamb – Eastern States Trade Lamb Indicator	07-Jul	Ac/kg cwt	857	849	1%	941	-9%
Pig – Eastern Seaboard (60.1–75 kg), average of buyers & sellers	23-Jun	Ac/kg cwt	318	318	0%	396	-20%
Goats – Eastern States (12.1–16 kg)	23-Jun	Ac/kg cwt	875	872	0%	748	17%
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	0%	#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	07-Jul	US\$/t	3,864	3,997	-3%	3,180	22%
Dairy – Skim milk powder	07-Jul	US\$/t	3,126	3,356	-7%	2,529	24%
Dairy – Cheddar cheese	07-Jul	US\$/t	3,949	4,328	-9%	3,950	0%
Dairy – Anhydrous milk fat	07-Jul	US\$/t	5,632	5,687	-1%	5,752	-2%

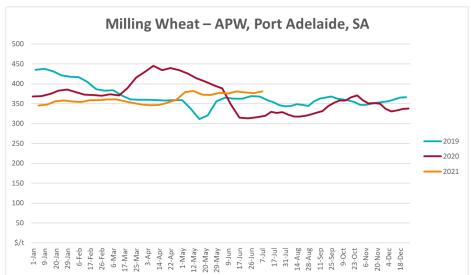
a Global Dairy Trade prices are updated twice monthly on the first and third Tuesday of each month.

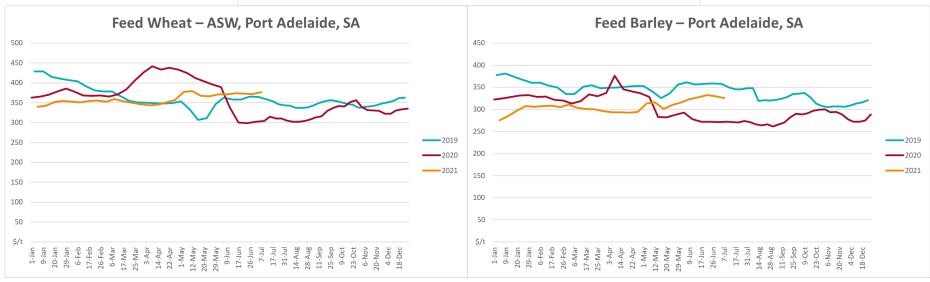
3.1. Selected world indicator prices

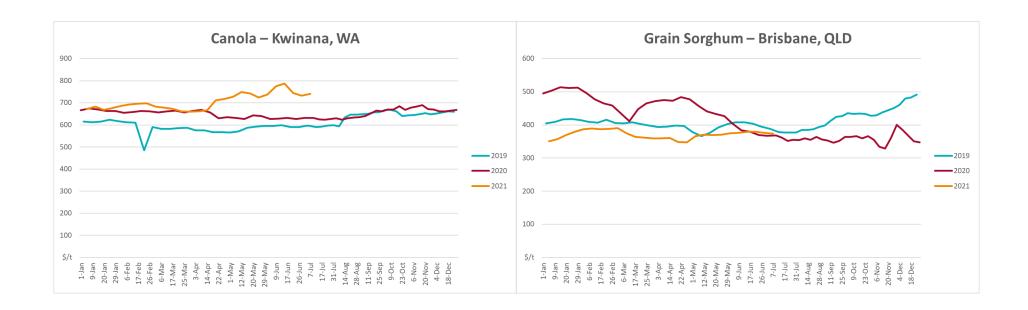




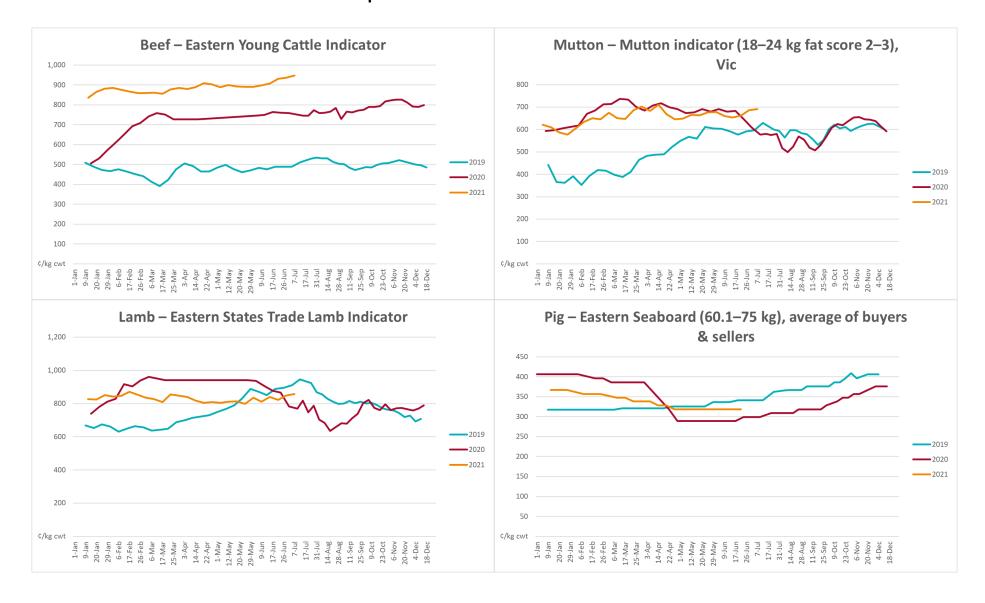
3.2. Selected domestic crop indicator prices

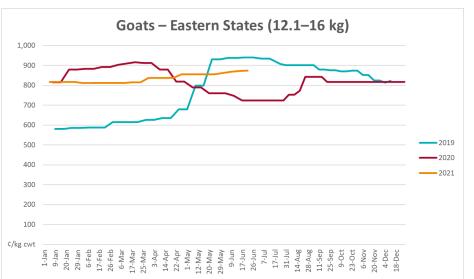


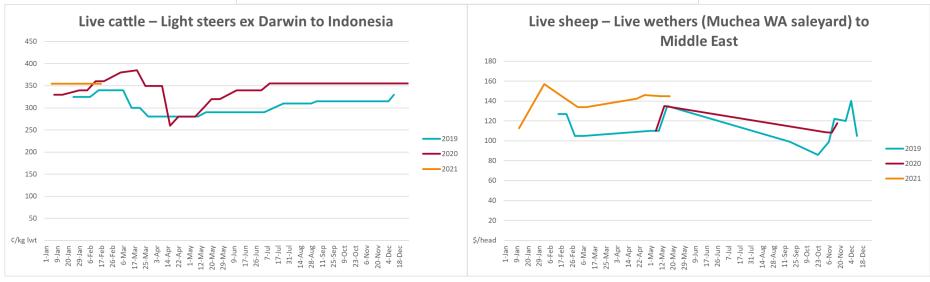




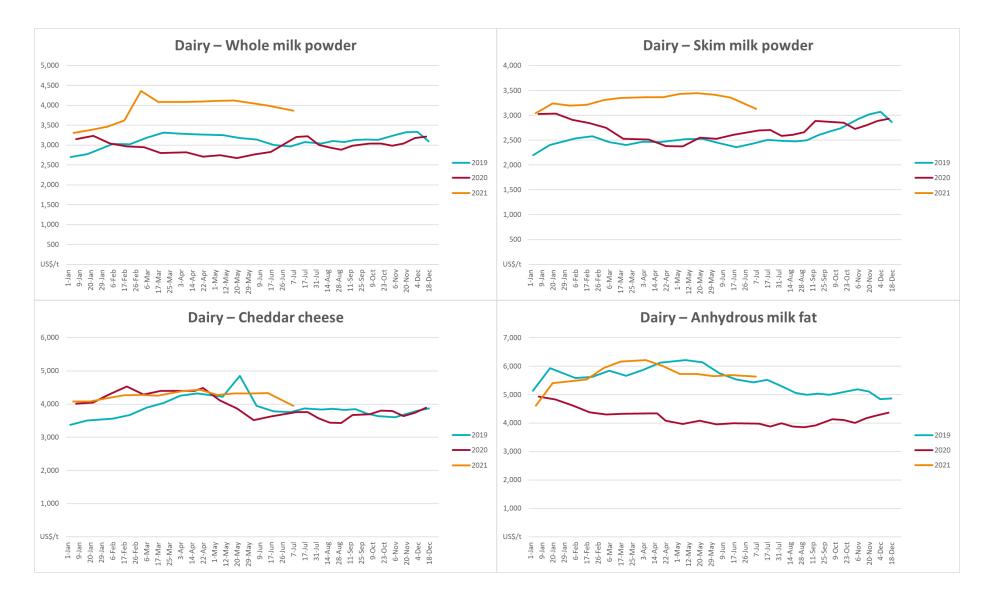
3.3. Selected domestic livestock indicator prices



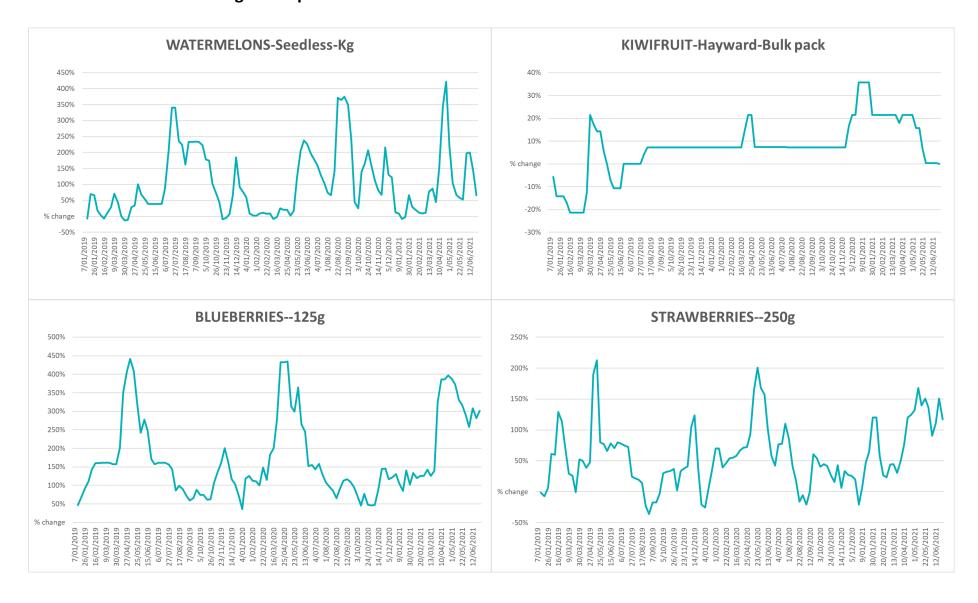


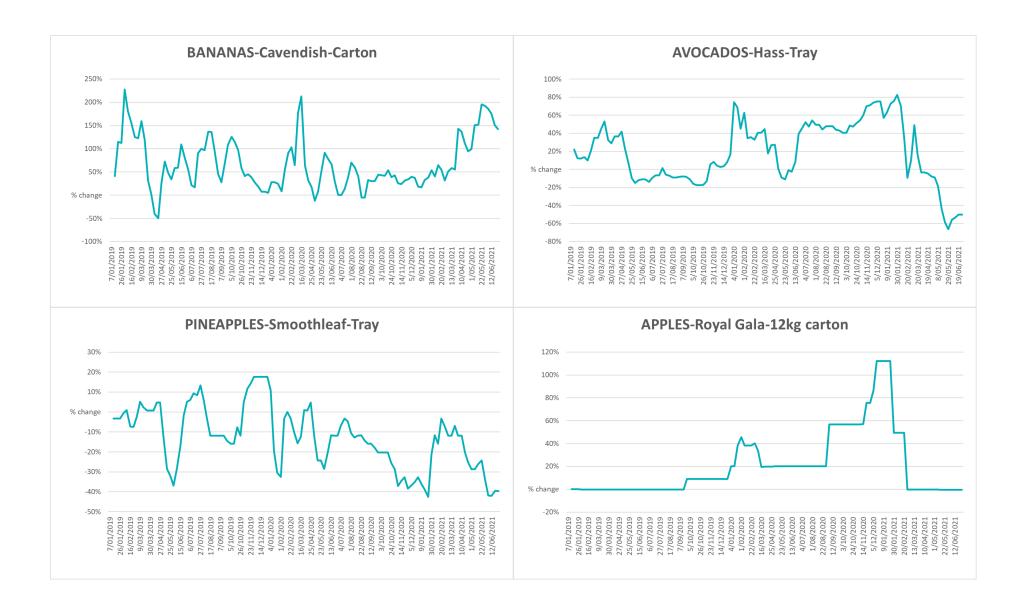


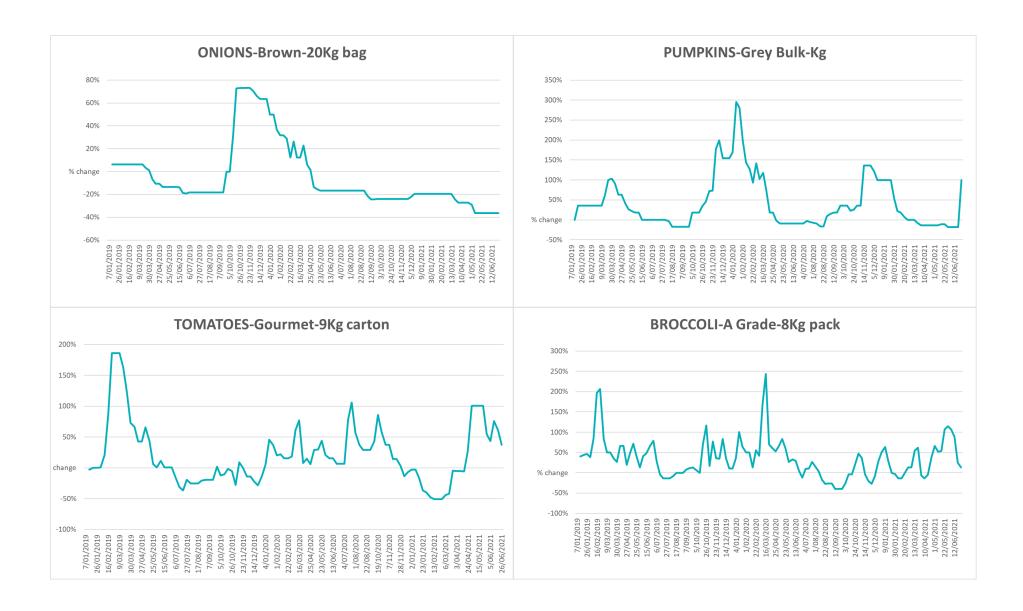
3.4. Global Dairy Trade (GDT) weighted average prices

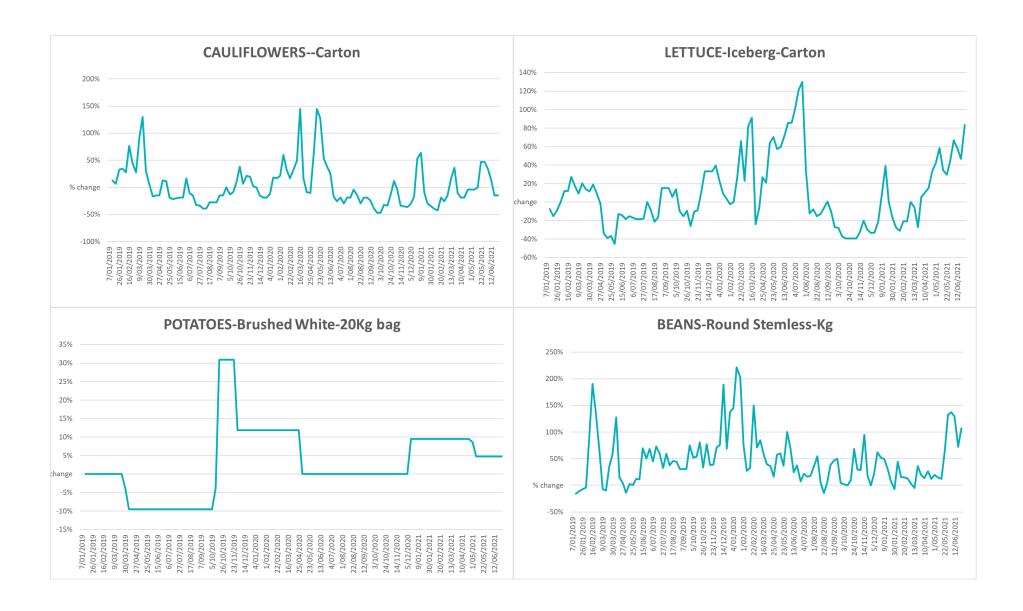


3.5. Selected fruit and vegetable prices

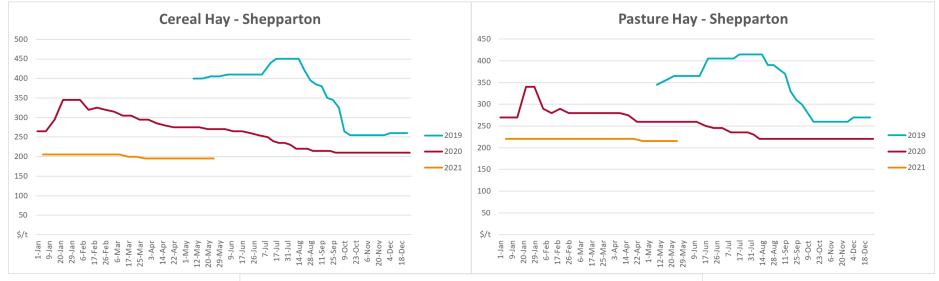


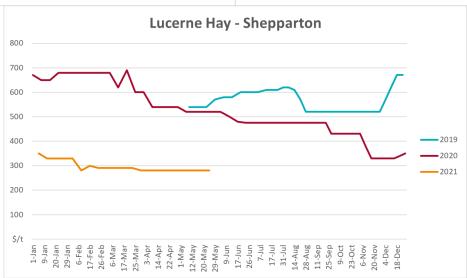






3.6. Selected domestic fodder indicator prices





4. Data attribution

Climate

Bureau of Meteorology

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

Other

- Pasture growth: <u>www.longpaddock.qld.gov.au/aussiegrass/</u>
- 3-month global outlooks: <u>Environment and Climate Change Canada</u>, <u>NOAA Climate Prediction Center</u>, <u>EUROBRISA CPTEC/INPE</u>, <u>European Centre for Medium-Range Weather Forecasts</u>, <u>Hydrometcenter of Russia</u>, <u>National Climate Center Climate System Diagnosis and Prediction Room (NCC)</u>, <u>International Research Institute for Climate and Society</u>
- 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: <u>www.freshstate.com.au</u>

Pigs

Australian Pork Limited: <u>www.australianpork.com.au</u>

Dairy

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

World wheat, canola

• International Grains Council

World coarse grains

• United States Department of Agriculture

World cotton

• Cotlook: <u>www.cotlook.com/</u>

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: <u>www.mla.com.au/Prices-and-market</u>

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