

Weekly Australian Climate, Water and Agricultural Update



No. 11/2022

24 March 2022

Summary of key issues

- For the week ending 23 March 2022, low-pressure troughs across northern and eastern Australia
 resulted in moderate rainfall in northern Australia and isolated falls in the south-east. In the south,
 high-pressure systems resulted in clear, dry conditions for large areas of central and western
 Australia, while cold fronts off the Southern Ocean produced moderate falls in Tasmania (see
 Section 1.1).
- Harvesting of early sown summer crops have continued across northern New South Wales and southern Queensland on the back of continued dry conditions. For late sown summer crops in Central Queensland, close to average soil moisture conditions have likely supported ongoing plant growth and development. For early sown summer crops with long growth periods, such as cotton, soil moisture levels have remained above average to average across most summer cropping regions, likely supporting boll filling in southern regions. Meanwhile, the dry conditions across northern regions have allowed harvesting of cotton to start.
- Atmospheric and oceanic indicators suggest that a La Niña remains active in the tropical Pacific.
 La Niña events typically increase the likelihood of tropical cyclones within the Australian region, as well as increasing the chances of above average rainfall across large parts of eastern Australia during autumn. The Madden-Julian Oscillation is also expected to influence rainfall patterns in Australia over the coming weeks, increasing the likelihood of above average rainfall across northern Australia, and also across tropical regions (see Section 1.2).
- The outlook for April 2022 indicates that there is a 75% chance of rainfall totals between 10 and 100 millimetres across eastern New South Wales, eastern and northern Queensland, eastern and southern Victoria, the far-north and far-south of Western Australia, the north of the Northern Territory and Tasmania. Rainfall totals in excess of 100 millimetres are expected in parts of northern Queensland, the north of the Northern Territory and western Tasmania (see Section 1.3).
- Over the 8-days to 31 March 2022, low-pressure troughs are expected to bring rainfall to eastern and northern Australia, with movement of Tropical Cyclone Charlotte off the west coast resulting in heavy rainfall in parts of Western Australia. Meanwhile, high pressure systems are expected to bring mostly dry conditions to central and southern Australia (see Section 1.4).
- Water storage in the Murray—Darling Basin (MDB) decreased by 287 gigalitres (GL) between 17 March 2022 and 24 March 2022. The current volume of water held in storage is 21,921GL, which represents 88 per cent of total capacity. This is 55% or 7,797 GL more than at the same time last year.
- Allocation prices in the Victorian Murray below the Barmah Choke decreased from \$60 per ML on 17 March 2022 to \$55 per ML on 24 March 2022. Prices are lower in the Goulburn-Broken, Murrumbidgee and regions above the Barmah choke due to the binding of the Goulburn intervalley trade limit, Murrumbidgee export limit and Barmah choke trade constraint.

1. Climate

1.1. Rainfall this week

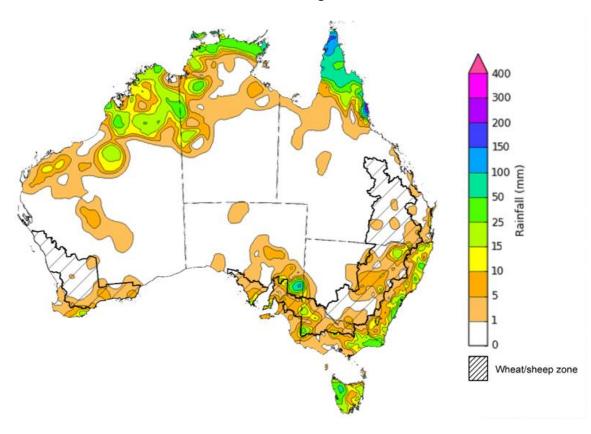
For the week ending 23 March 2022, low-pressure troughs across northern and eastern Australia resulted in moderate rainfall in northern Australia and isolated falls in the south-east. In the south, high-pressure systems resulted in clear, dry conditions for large areas of central and western Australia, while cold fronts off the Southern Ocean produced moderate falls in Tasmania.

Rainfall totals of between 10 and 50 millimetres were recorded across scattered areas of eastern New South Wales, eastern and western Victoria, the south-east of South Australia, as well as northern parts of Western Australia and the Northern Territory, and Tasmania. Rainfall totals in excess of 50 millimetres were recorded across northern Queensland. Remaining parts of Australia received little to no rainfall.

In cropping regions, rainfall totals of between 10 and 25 millimetres were recorded across isolated parts of New South Wales, Victoria and South Australia. Little to no rainfall was recorded across cropping regions in remaining parts of New South Wales, Victoria and South Australia, as well as Queensland and Western Australia.

Harvesting of early sown summer crops have continued across northern New South Wales and southern Queensland on the back of continued dry conditions. For late sown summer crops in Central Queensland, close to average soil moisture conditions have likely supported ongoing plant growth and development. For early sown summer crops with long growth periods, such as cotton, soil moisture levels have remained above average to average across most summer cropping regions, likely supporting boll filling in southern regions. Meanwhile, the dry conditions across northern regions have allowed harvesting of cotton to start.

Rainfall for the week ending 23 March 2022



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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. **Climate Drivers**

Throughout autumn the climate drivers with the largest potential impact on Australia's climate patterns are the El Niño-Southern Oscillation (ENSO), Southern Annular Mode (SAM) and the Madden-Julian Oscillation (MJO). These climate drivers are likely to influence the growth and development of later planted summer crops in northern growing regions, pasture growth across both northern and southern Australia and planting opportunities for winter crops.

Atmospheric and oceanic indicators suggest that a La Niña remains active in the tropical Pacific. La Niña events typically increase the likelihood of tropical cyclones within the Australian region, as well as increasing the chances of above average rainfall across large parts of eastern Australia during autumn. The strengthening of trade winds in the western Pacific Ocean have delayed the decline of the current La Niña event. Nevertheless, the event is expected to dissipate over the coming months. Despite the easing of La Niña atmospheric and oceanic patterns, they are likely to continue influencing rainfall patterns in northern and eastern Australia over the coming months.

The MJO is also expected to influence rainfall patterns in Australia over the coming weeks, increasing the likelihood of above average rainfall across northern Australia, and also across tropical regions to Australia's north.

The Southern Annular Mode (SAM) is neutral and is forecast to remain neutral over the coming three weeks. A neutral SAM has little influence on Australian climate.

Below average sea surface temperature (SST) anomalies have continued to move eastward in the tropical Pacific Ocean over the past two weeks. SSTs in the equatorial Pacific are expected to begin warming as sub-surface waters become warmer, although the strengthening of trade winds have stalled this process. Current SST anomalies reflect typical La Niña patterns, with below average SST along the equator, and warm SST anomalies to the north and south.

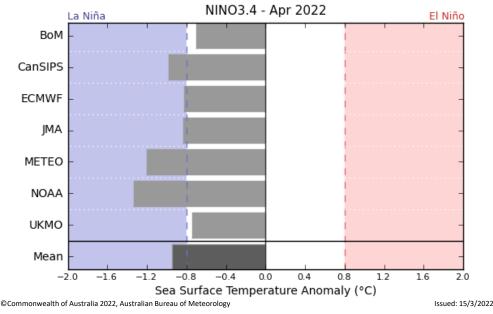
120°F 160°F 160°W 120°W 80°W -1.2-0.8 Difference from average (°C)

Difference from average sea surface temperature observations 7 to 13 March 2022

Data: BOM SST Climatology baseline: 1961 to 1990 © Commonwealth of Australia 2022, Australian Bureau of Meteorology

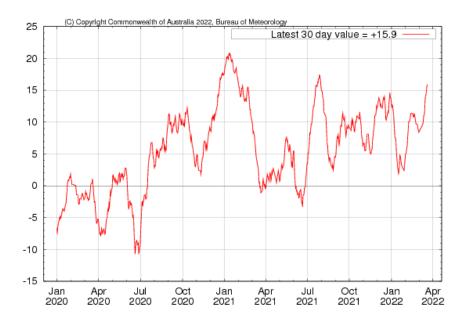
Weekly average: 13 March 2022 http://www.bom.gov.au/climate Created: 14/03/2022

International climate model outlooks for the NINO 3.4 region in April 2022



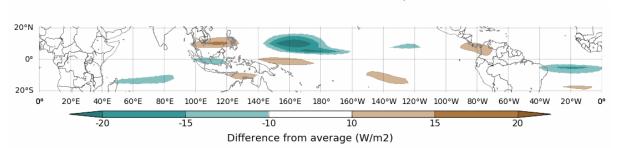
The La Niña event in the Pacific Ocean is now past its peak and is expected to continue to dissipate through autumn. Most climate models surveyed by the Bureau of Meteorology expect the La Niña event to continue into April due to recent strengthening in trade winds. However, only one of the seven models expecting it to remain active in June 2022. ENSO events are most active throughout spring and summer, then decay and return to neutral conditions in autumn. For the period ending 21 March 2022, the 30-day SOI was +15.9 and the 90-day SOI was +8.7, both above the La Niña threshold of +7. Above average SST anomalies have continued across parts of the Maritime Continent. Trade winds across the western tropical Pacific have increased in strength and remain stronger than average, while cloudiness near the Date Line has been consistently below average since June 2021. These indications are consistent with the ongoing La Niña event.

30-day Southern Oscillation Index (SOI) values ending 21 March 2022



As at 21 March 2022 a pulse of the Madden–Julian Oscillation (MJO) is strengthening over the Indian Ocean. Most climate models suggest the MJO is likely to progress eastwards into the Maritime Continent in the coming week. The MJO is a pulse of cloud and rainfall that moves eastward along the equator and increases the chance of above average cloudiness and rainfall across northern Australia.

Madden-Julian Oscillation (MJO) daily index



www.bom.gov.au/climate

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Base period: 1981-2018

Model run date: 21/03/2022

Note: This map displays the forecast outgoing longwave radiation (OLR) difference from expected cloudiness to identify convective rain clouds and the position of the Madden-Julian

Oscillation (MJO). The blue shading indicates higher than normal, active or enhanced tropical weather and the brown shading indicates lower than normal clouds or suppressed conditions.

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.

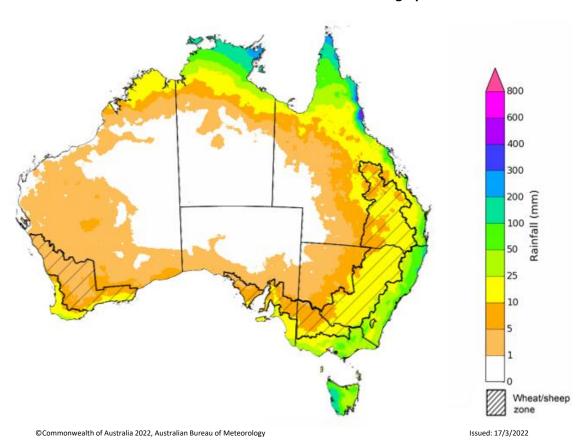
For further information, go to http://www.bom.gov.au/climate/ahead/about/

The Bureau of Meteorology's latest rainfall outlook indicated wetter than average conditions are expected across parts of northern and eastern Australia during April. The ACCESS-S climate model suggests there is close to a 60% chance of exceeding median April rainfall totals across parts of eastern Australia, and an 80% chance of exceeding median rainfall totals in parts of northern Australia.

The outlook for April 2022 indicates that there is a 75% chance of rainfall totals between 10 and 100 millimetres across eastern New South Wales, eastern and northern Queensland, eastern and southern Victoria, the far-north and far-south of Western Australia, the north of the Northern Territory and Tasmania. Rainfall totals in excess of 100 millimetres are expected in parts of northern Queensland, the north of the Northern Territory and western Tasmania.

Across cropping regions there is a 75% chance of rainfall totals of between 10 and 25 millimetres across most of New South Wales, Queensland, eastern and southern Victoria and isolated parts of South Australia and Western Australia. There is a 75% chance of rainfall less than 10 millimetres for western Victoria, as well as much of South Australia and Western Australia. The wetter than average conditions are expected to boost soil moisture levels and provide a favourable start to the winter season in most eastern Australian cropping regions and support late sown summer crops in Central Queensland. On the flipside, wetter than average conditions might limit field access and interfere with the timely planting of winter crops and harvesting activity for summer crops.

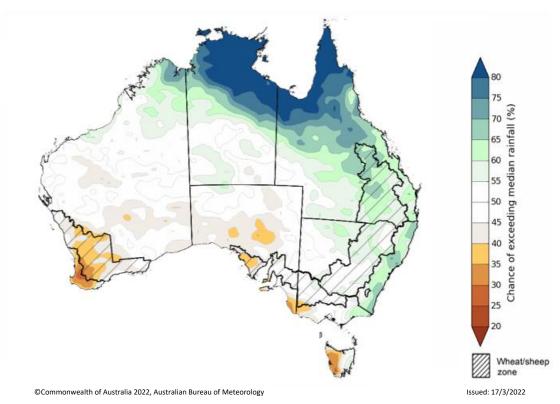
Rainfall totals that have a 75% chance of occurring April 2022



The rainfall outlook for April to June 2022 suggests there is a greater than 60% chance of exceeding median rainfall across coastal parts of New South Wales, much of south-central Queensland and farnorthern parts of the Western Australia. For much of northern Queensland and the Northern Territory, there is a greater than 70% chance of exceeding median rainfall. Between April and June 2022, below average rainfall is expected for south-western Western Australia, isolated parts of Victoria and South Australia, as well as western Tasmania. For remaining regions of Australia, there is roughly an equal chance of above and below median rainfall (Bureau of Meteorology 'National Climate Outlook', 17 March 2022).

Bureau of Meteorology rainfall outlooks for April to June have greater than 55% past accuracy across most of Australia. Outlook accuracy is greater than 65% across large areas of eastern, northern and western Australia. However, there is low past accuracy for isolated parts of South Australia.

Chance of exceeding the median rainfall April to June 2022

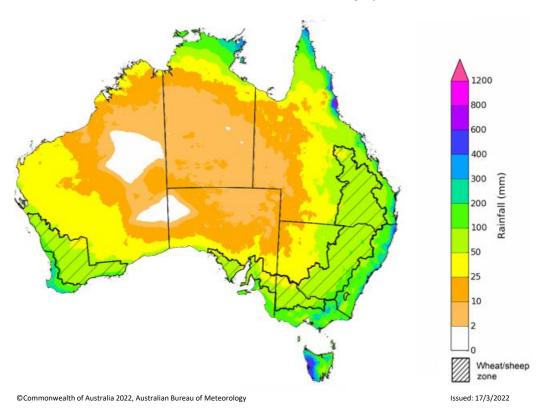


The outlook for April to June 2022 suggests there is a 75% chance of rainfall totals between 50 and 200 millimetres across much of eastern New South Wales, eastern and northern Queensland, much of Victoria, southern parts of South Australia, the south-west of Western Australia, northern parts of the Northern Territory and eastern Tasmania. Rainfall totals in excess of 200 millimetres are forecast for parts of New South Wales and Queensland, alpine regions of New South Wales and Victoria, northern parts the Northern Territory and western Tasmania.

Across cropping regions, there is a 75% chance of receiving between 50 and 100 millimetres across much of New South Wales, Queensland, southern Victoria, southern and western parts of South Australia and much of Western Australia. Totals of less than 50 millimetres are expected across remaining cropping regions in northern Victoria, the north-east of South Australia and isolated parts of Western Australia.

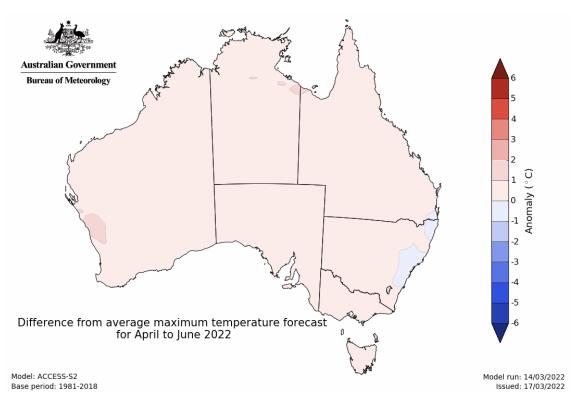
Root zone soil moisture levels are above average to average across most eastern and southern cropping regions but is below average to average in western cropping regions. The above average rainfall in eastern cropping regions is likely to support yield potentials for late sown summer crops in northern cropping regions, as well as aiding the germination and establishment of winter crops. However, the wetter conditions may limit field access, delaying harvesting and planting activity. In cropping regions of Western Australia, the expectation of below average rainfall over the next three months is likely to provide a less than ideal start to the winter cropping season, with a likely deterioration in soil moisture levels.

Rainfall totals that have a 75% chance of occurring April to June 2022

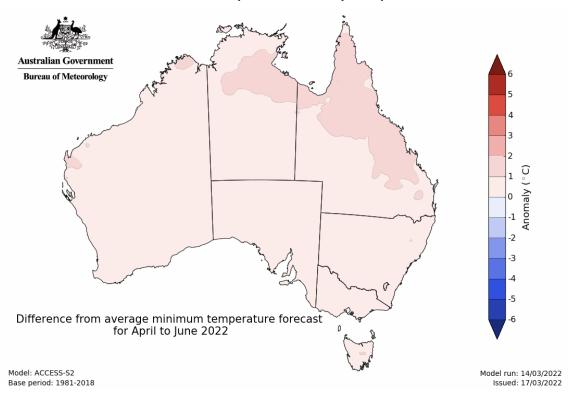


The temperature outlook for April to June 2022 indicates that maximum temperatures across most of Australia are likely to be close to the 1990-2012 average (- 1°C to 1°C). Minimum temperatures are expected to be slightly above average for parts of Queensland and the Northern Territory, and close to average for the rest of Australia (Bureau of Meteorology 'National Climate Outlook', 17 March 2022).

Predicted maximum temperature anomaly for April to June 2022



Predicted minimum temperature anomaly for April to June 2022



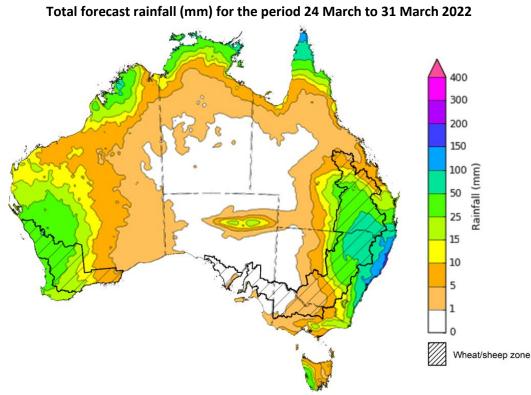
1.4. Rainfall forecast for the next eight days

Over the 8-days to 31 March 2022, low-pressure troughs are expected to bring rainfall to eastern and northern Australia, with movement of Tropical Cyclone Charlotte off the west coast resulting in heavy rainfall in parts of Western Australia. Meanwhile, high pressure systems are expected to bring mostly dry conditions to central and southern Australia.

Rainfall totals of between 10 and 50 millimetres are forecast for eastern New South Wales, south-eastern and northern Queensland, parts of eastern Victoria, western and northern parts of Western Australia, western Tasmania, as well as central South Australia and the north of the Northern Territory. Rainfall in excess of 100 millimetres is expected for north-eastern New South Wales and northern Queensland.

In Australian cropping regions, rainfall totals of between 10 and 50 millimetres are expected across northern and central New South Wales, southern and central Queensland, as well as western and central Western Australia. Little to no rainfall is forecast for all remaining cropping regions during the next 8-days.

The wet conditions forecast across northern New South Wales and southern Queensland will likely interfere with harvesting of early sown summer crops. The rainfall may also delay senescence of summer crops with longer growth periods. However, the rainfall will boost soil moisture levels and support winter crops as planting gets under way in the coming months. Cropping regions of Central Queensland and southern New South Wales are expected to largely miss out on the heaviest of falls, but soil moisture levels in these regions remain close to average, which will support ongoing crop development. The forecast rainfall for western cropping regions will help boost soil moisture, where it is currently below average.



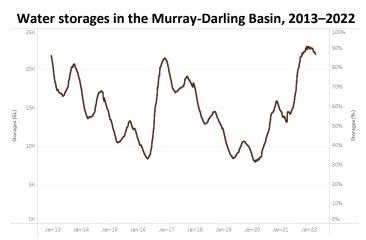
©Commonwealth of Australia 2022, Australian Bureau of Meteorology

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) decreased by 287 gigalitres (GL) between 17 March 2022 and 24 March 2022. The current volume of water held in storage is 21,921GL, which represents 88 per cent of total capacity. This is 55% or 7,797 GL more than at the same time last year.

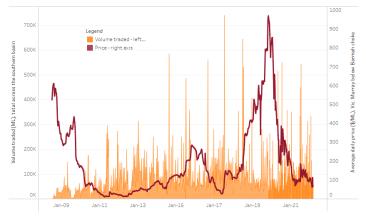


Water storage data is sourced from the Bureau of Meteorology.

Allocation prices in the Victorian Murray below the Barmah Choke decreased from \$60 per ML on 17 March 2022 to \$55 per ML on 24 March 2022. Prices are lower in the Goulburn-Broken, Murrumbidgee and regions above the Barmah choke due to the binding of the Goulburn intervalley trade limit, Murrumbidgee export limit and Barmah choke trade constraint.

Region	\$/ML
NSW Murray Above	31
NSW Murrumbidgee	18
VIC Goulburn-Broken	50
VIC Murray Below	55

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 24 March 2022.

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-240322

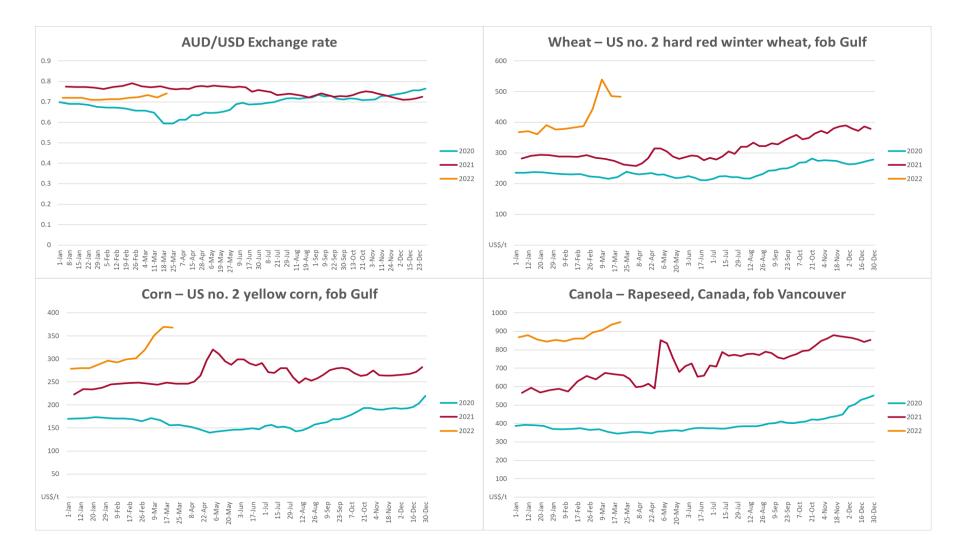
3. Commodities

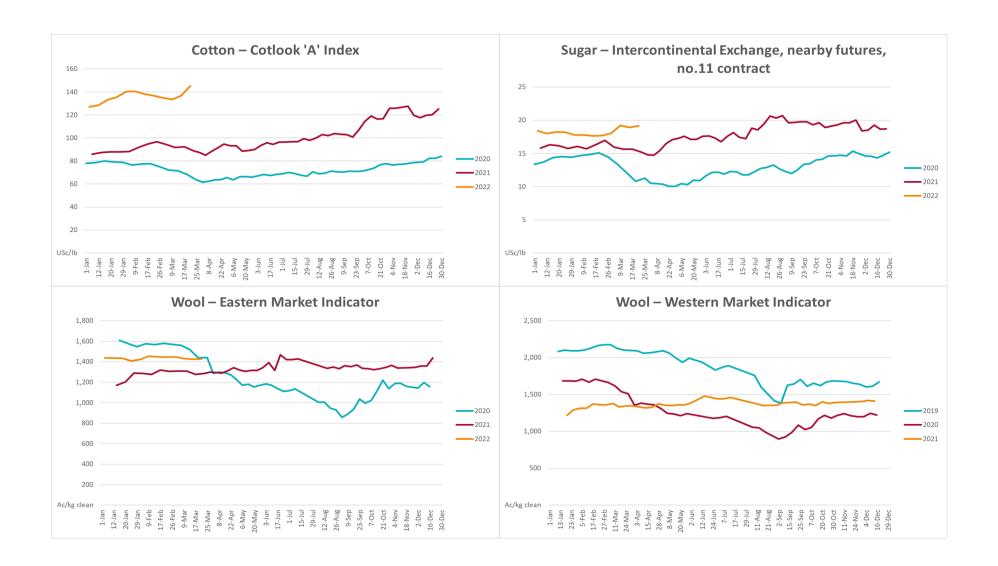
Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
Selected world indicator prices							
AUD/USD Exchange rate	23-Mar	A\$/US\$	0.74	0.72	3%	0.76	-2%
Wheat – US no. 2 hard red winter wheat, fob Gulf	23-Mar	US\$/t	483	485	0%	260	86%
Corn – US no. 2 yellow corn, fob Gulf	23-Mar	US\$/t	368	369	0%	246	49%
Canola – Rapeseed, Canada, fob Vancouver	23-Mar	US\$/t	950	936	2%	641	48%
Cotton – Cotlook 'A' Index	23-Mar	USc/lb	145	137	6%	87	66%
Sugar – Intercontinental Exchange, nearby futures, no.11 contract	23-Mar	USc/lb	19.1	18.9	1%	15	29%
Wool – Eastern Market Indicator	23-Mar	Ac/kg clean	1,429	1,424	0%	1,285	11%
Wool – Western Market Indicator	02-Feb	Ac/kg clean	1,443	1,455	-1%	1,024	41%
Selected Australian grain export prices							
Milling Wheat – APW, Port Adelaide, SA	23-Mar	A\$/t	594	586	1%	348	71%
Feed Wheat – ASW, Port Adelaide, SA	23-Mar	A\$/t	560	547	2%	346	62%
Feed Barley – Port Adelaide, SA	23-Mar	A\$/t	461	441	4%	296	56%
Canola – Kwinana, WA	23-Mar	A\$/t	1,166	1,175	-1%	660	77%
Grain Sorghum – Brisbane, QLD	23-Mar	A\$/t	375	376	0%	359	4%
Selected domestic livestock indicator prices							
Beef – Eastern Young Cattle Indicator	23-Mar	Ac/kg cwt	1,115	1,129	-1%	861	29%
Mutton – Mutton indicator (18–24 kg fat score 2–3), Vic	23-Mar	Ac/kg cwt	571	562	2%	650	-12%
Lamb – Eastern States Trade Lamb Indicator	23-Mar	Ac/kg cwt	801	807	-1%	835	-4%
Pig – Eastern Seaboard (60.1–75 kg), average of buyers & sellers	26-Jan	Ac/kg cwt	357	357	0%	309	16%
Goats – Eastern States (12.1–16 kg)	19-Jan	Ac/kg cwt	879	879	0%	818	8%
Live cattle – Light steers ex Darwin to Indonesia	23-Mar	Ac/kg lwt	550	550	0%	350	57%
Live sheep – Live wethers (Muchea WA saleyard) to Middle East	22-Sep	\$/head	147	171	-14%	126	17%

Indicator	Week ended	Unit	Latest	Previous	Weekly	Price 12	Annual
	week ended	Oilit	price	week	change	months ago	change
Global Dairy Trade (GDT) weighted average prices ^a							
Dairy – Whole milk powder	16-Mar	US\$/t	4,596	4,757	-3%	3,039	51%
Dairy – Skim milk powder	16-Mar	US\$/t	4,545	4,481	1%	2,907	56%
Dairy – Cheddar cheese	16-Mar	US\$/t	6,412	6,394	0%	4,526	42%
Dairy – Anhydrous milk fat	16-Mar	US\$/t	7,111	7,048	1%	4,379	62%

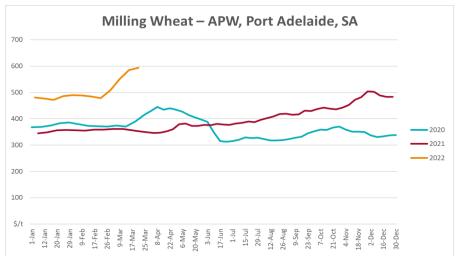
a Global Dairy Trade prices are updated twice monthly on the first and third Tuesday of each month.

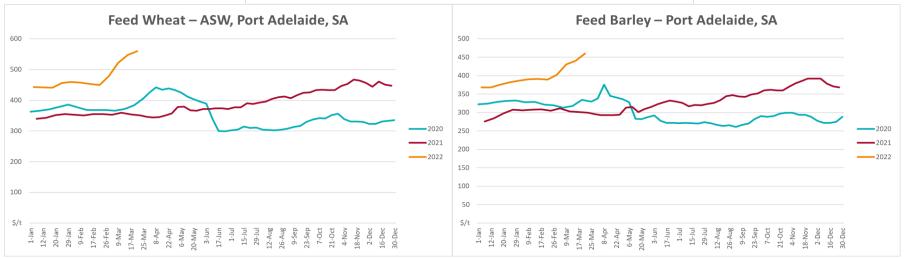
3.1. Selected world indicator prices

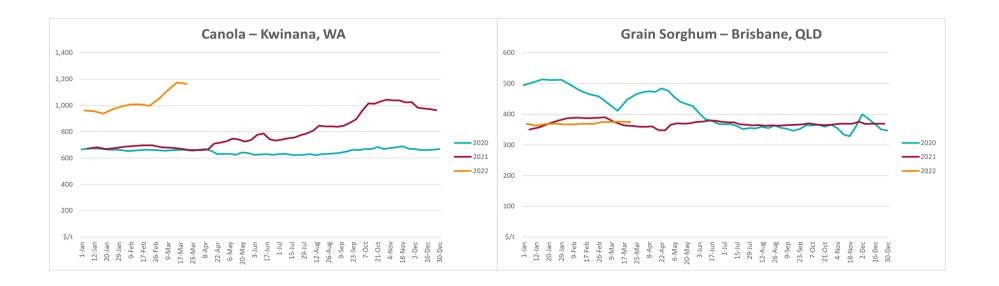




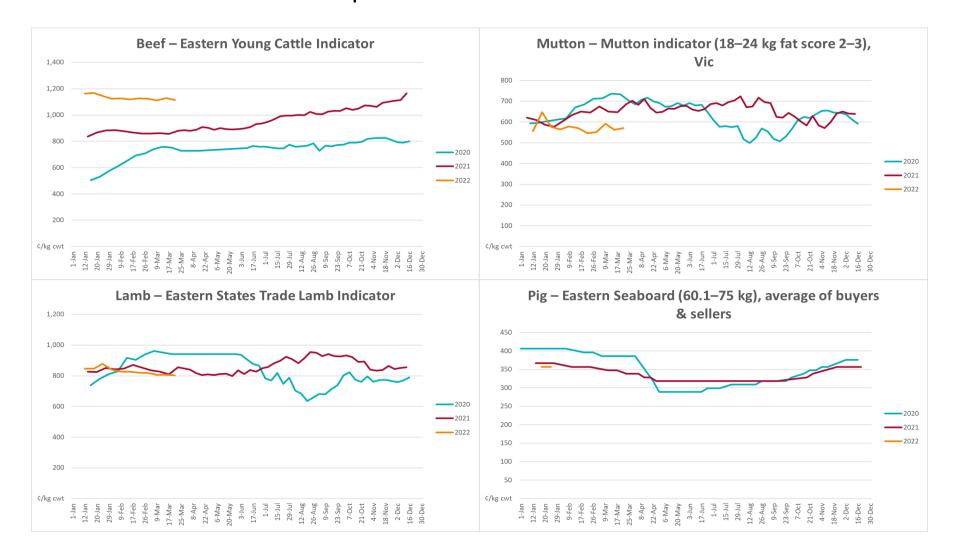
3.2. Selected domestic crop indicator prices

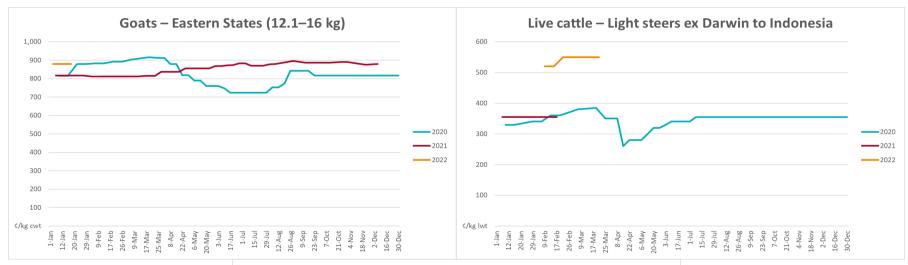


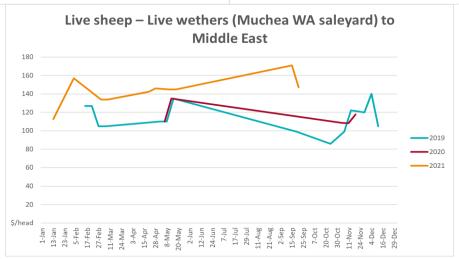




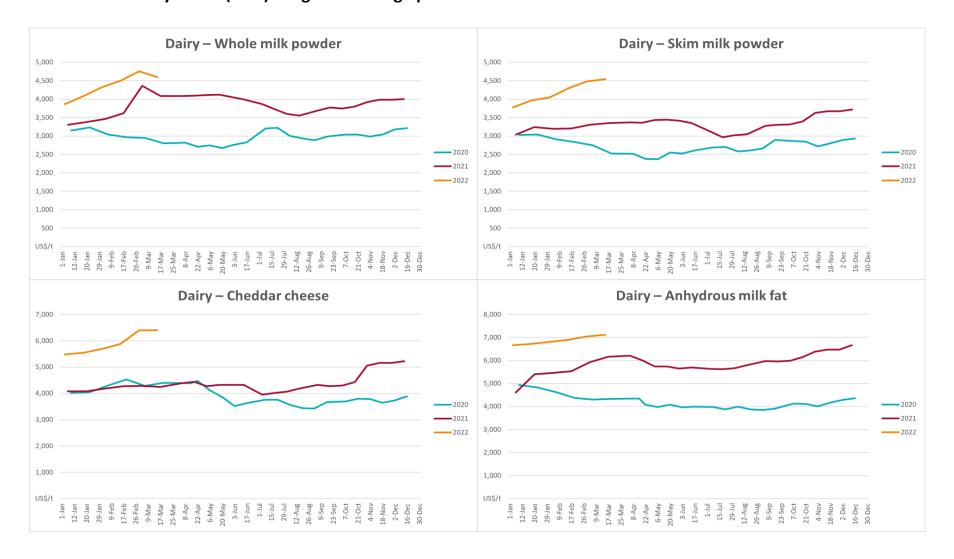
3.3. Selected domestic livestock indicator prices



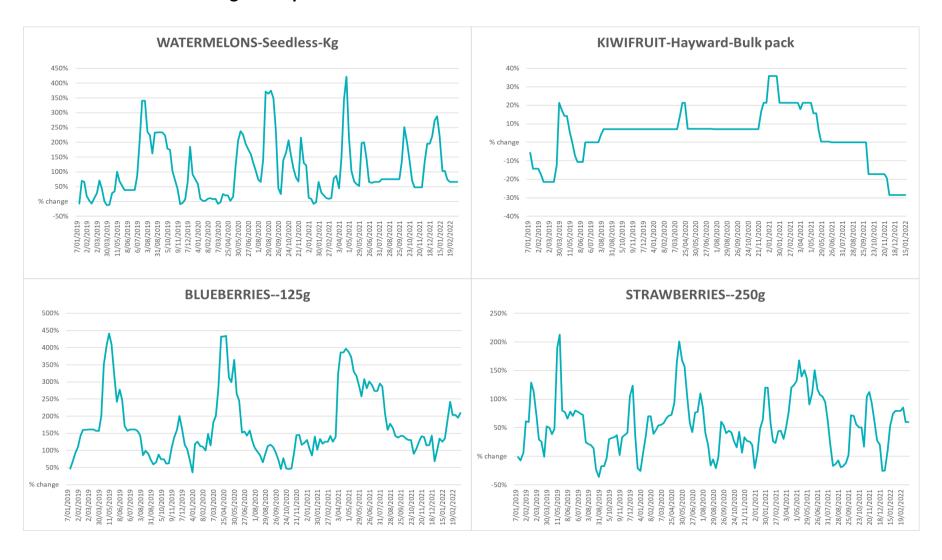


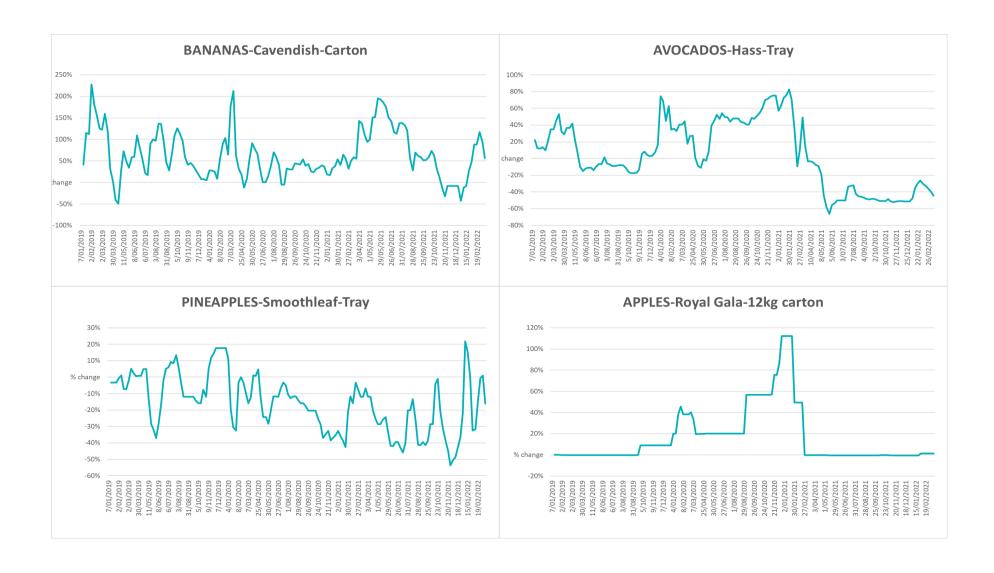


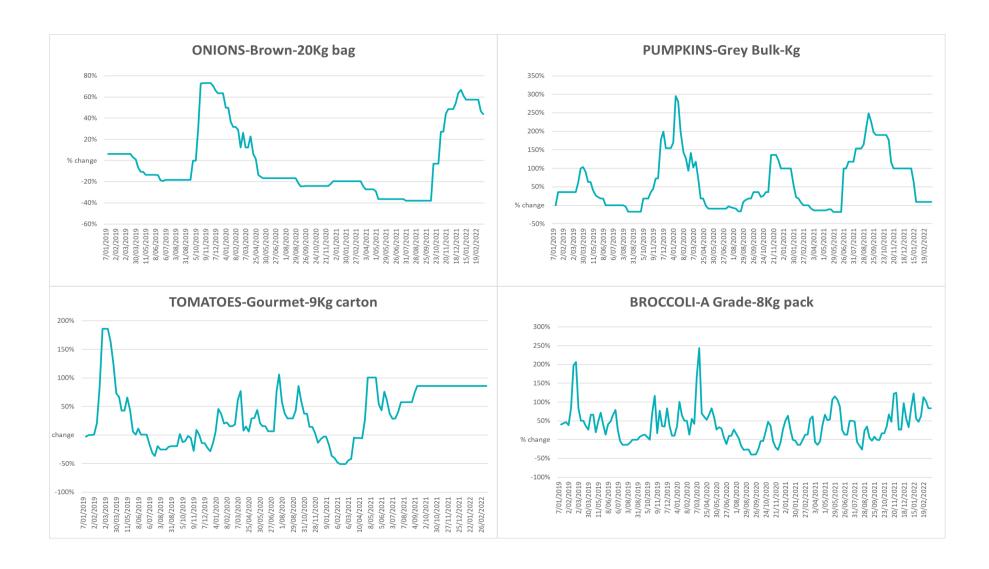
3.4. Global Dairy Trade (GDT) weighted average prices

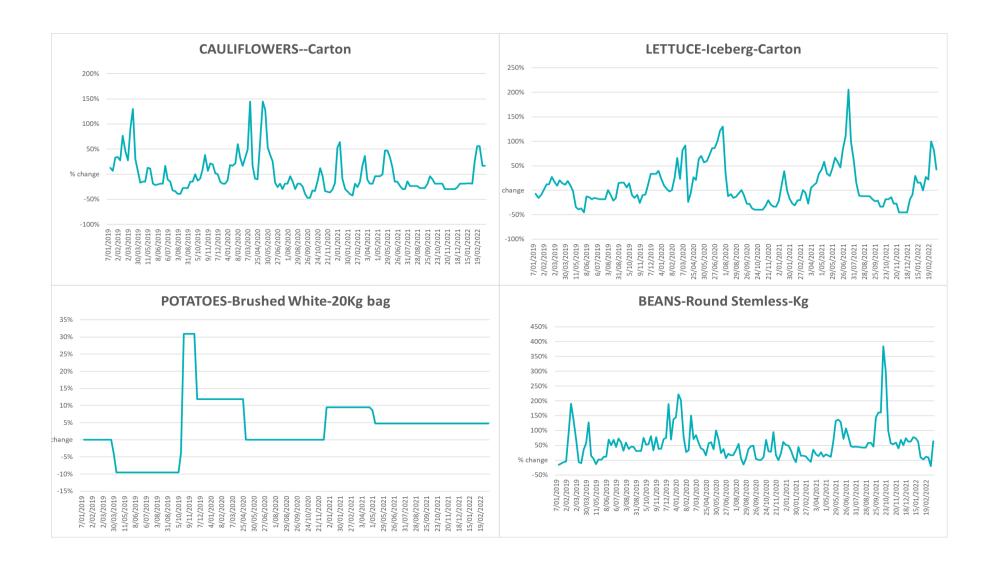


3.5. Selected fruit and vegetable prices

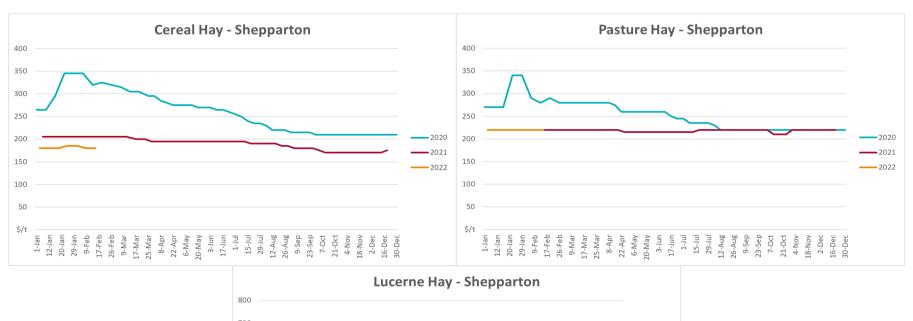


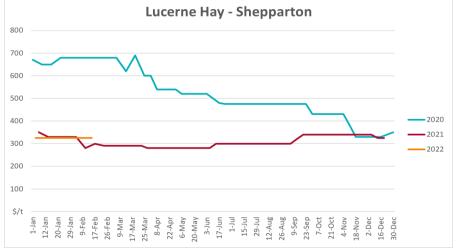






3.6. Selected domestic fodder indicator prices





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, canola and fodder

• 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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