

### Australian Government

Department of Agriculture, Water and the Environment ABARES

# Weekly Australian Climate, Water and Agricultural Update



No. 11/2021

25 March 2021

# Summary of key issues

- During the 7 days to 24 March 2021, troughs and low-pressure systems generated thunderstorms and showers across eastern, central and northern Australia, with large areas recording weekly rainfall totals in excess of four times their March average (see Section 1.1).
- The heavy rainfall across eastern Australia this week led to widespread flood warnings and recordbreaking flood peaks in some areas. This flooding has disrupted some agricultural activities and caused severe localised damage to infrastructure and is likely to have resulted in some loss of livestock and crops. In contrast, the rainfall associated with this event will provide a substantial boost to soil moisture and water storages, benefitting future winter and summer crop production and pasture growth (see Section 1.1).
- ABARES analysis of daily rainfall data sourced from the Bureau of Meteorology indicates that an
  early autumn break has been achieved across much of New South Wales and Queensland, parts of
  central and eastern Victoria and large areas of Western Australia (see Section 1.2)
- Atmospheric and oceanic indicators continue to suggest the La Niña event is drawing to a close. Favourable production conditions associated with the La Niña are likely to persist through autumn as the La Niña event weakens (see Section 1.3).
- There is a 50% chance of recording average or better April to June rainfall across most winter cropping regions. Given the average or better soil moisture levels across cropping regions in much of New South Wales, South Australia and Western Australia, these falls will likely support at least average pasture growth and the planting of winter crops (see Section 1.4).
- Over the next 8 days, troughs, onshore winds and cold fronts are expected to generate showers and storms over parts of northern, eastern and southern Australia.
- In Australia's cropping regions, rainfall of between 1 and 10 millimetres is expected for parts of south-eastern New South Wales, northern and eastern Queensland, southern Victoria, South Australia and southern Western Australia over the next 8 days. Following an early autumn break across most winter cropping regions in western and eastern Australia, these low rainfall totals will likely allow farmers to begin sowing winter forage crops (see Section 1.5).
- Water storage levels in the Murray-Darling Basin (MDB) increased by 177 gigalitres (GL) between 17 March 2021 and 24 March 2021. The current volume of water held in storage is 13,041 GL, which represents 52% of total capacity.
- Allocation prices in the Victorian Murray below the Barmah Choke decreased from \$100 per ML on 18 March 2021 to \$69 per ML on 25 March 2021. Prices are lower in the Murrumbidgee due to the binding of the Murrumbidgee export limit.

# 1. Climate

# 1.1. Rainfall this week

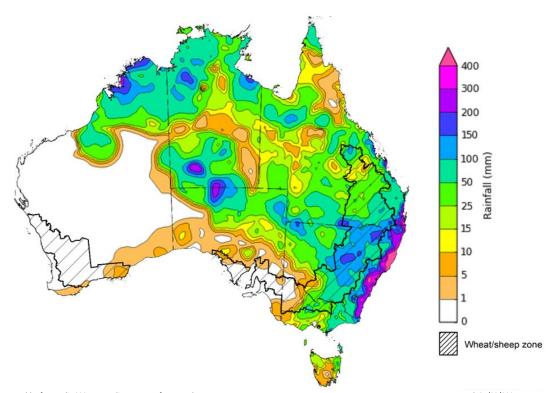
During the week ending 24 March 2021, troughs and low-pressure systems generated thunderstorms and showers across parts of eastern, central and northern Australia.

Rainfall totals of between 25 and 100 millimetres were recorded across much of New South Wales, Queensland and the Northern Territory, and parts of eastern and central Victoria, northern South Australia, northern Western Australia and north-eastern Tasmania. Rainfall in excess of 100 millimetres was recorded across much of central and eastern New South Wales and parts of southern Queensland, central Australia, northern Western Australia and the north of the Northern Territory. Rainfall in excess of 200 millimetres was recorded across the eastern coast of New South Wales and far south-eastern Queensland, with rainfall totals greater than 400 millimetres across parts of the central New South Wales coast.

In Australia's cropping regions, rainfall totals of between 25 and 100 millimetres were recorded across much of Queensland and parts of south-western New South Wales and eastern Victoria. Rainfall totals between 100 and 200 millimetres were recorded in cropping regions across much of central and northern New South Wales and parts of southern Queensland. Little to no rainfall was recorded across cropping regions in South Australia and Western Australia.

The heavy rainfall across eastern Australia this week led to widespread flood warnings and record-breaking flood peaks in some areas. This flooding has disrupted some agricultural activities and caused severe localised damage to infrastructure and is likely to have resulted in some loss of livestock and crops. In contrast, the rainfall associated with this event will provide a substantial boost to soil moisture and water storages, benefitting future winter and summer crop production and pasture growth.

#### Rainfall for the week ending 24 March 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 <a href="https://www.bom.gov.au/climate/rainfall/">https://www.bom.gov.au/climate/rainfall/</a>

# 1.2. Early autumn break

In southern Australia, the timing of the autumn break is an important ingredient for a successful pasture and crop production season. The autumn break is the first significant rainfall of the winter growing season and provides enough moisture to initiate crop and pasture germination and support early plant growth. The break generally applies to the southern pasture and cropping areas mainly in New South Wales, Victoria, South Australia, Western Australia and Tasmania — and occasionally parts of southern Queensland.

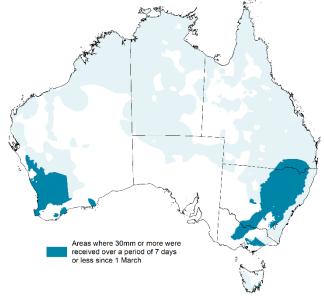
Southern pasture and cropping areas influenced by the autumn break

Areas likely to be influenced by the autumn break

Source: ABARES

An early autumn break can increase the length of the growing season, potentially improving production and yield. The definition of the autumn break in southern Australia varies. Pook et al. (2009) suggested an ideal break for north-western Victoria occurs during March–June when a mean fall of 25 millimetres or more is recorded over a period of 3 days or less, or when a mean fall of 30 millimetres or more is recorded over a period of 7 days or less.

Areas that have achieved 30 millimetres in any 7-day period from 1 March to 22 March 2021



Source: Bureau of Meteorology, ABARES

ABARES has adapted the Pook et al. (2009) autumn break definition of falls of 30 millimetres or more recorded within any 7-day period from 1 March to identify where the autumn break threshold has been achieved across southern Australia. ABARES analysis of daily rainfall data sourced from the Bureau of Meteorology indicates that the autumn break has been achieved across much of New South Wales and Queensland, parts of central and eastern Victoria and large areas of Western Australia.

Typically, the autumn break is driven by westerly fronts moving across southern Australia and cut-off low pressure systems. This uncharacteristic early autumn break in south-eastern Australia has been driven by incursions of moist tropical air from northern Australia resulting in substantial rainfall.

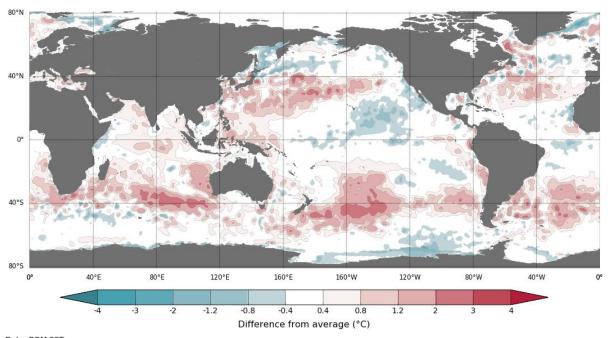
### 1.3. Climate Drivers

With the summer cropping and northern pasture production season drawing to a close, the focus shifts to likely conditions for autumn and the start of the winter cropping season. To gain some insight, it is important to look at the climate drivers—the El Niño—Southern Oscillation (ENSO), the Indian Ocean Dipole (IOD) and the Madden—Julian Oscillation (MJO)—that can influence autumn and early winter rainfall across Australia.

The La Niña event that has influenced Australia's climate over the past several months may be drawing to a close as oceanic indicators suggest a return to neutral conditions. While the La Niña event has brought favourable growing conditions for summer crops and pasture production across northern and eastern Australia, a return to neutral conditions reduces the influence ENSO has on Australian weather patterns. The favourable growing conditions resulting from the La Niña event were central in developing ABARES summer crop and livestock production forecasts embodied in the ABARES March 2021 edition of the <u>Agricultural commodities</u> and February 2021 edition of the <u>Australian crop report</u>. The favourable production conditions, with above average rainfall, are likely to persist through autumn as the La Niña event weakens.

Sea surface temperature anomalies across much of the tropical Pacific Ocean have weakened over the past two weeks. The below average temperatures had remained steady over the preceding months, but have largely seen a return to the long-term average. Warm sea surface temperature anomalies in the waters near Western Australia have strengthened considerably and warm anomalies remain in the waters near Indonesia and the Philippines. As at 16 March 2021 all of the international climate models surveyed are expecting sea surface temperature across the tropical Pacific Ocean to return to neutral ENSO values by May and remain neutral until at least August.

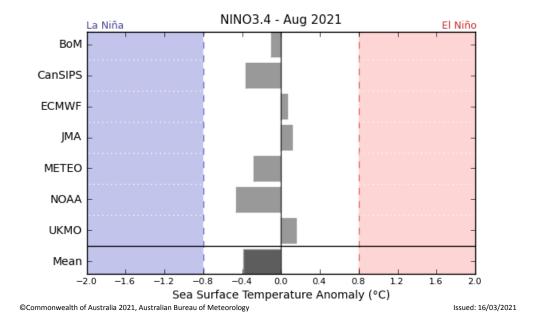
### Difference from average sea surface temperature observations 8 March to 14 March 2021



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

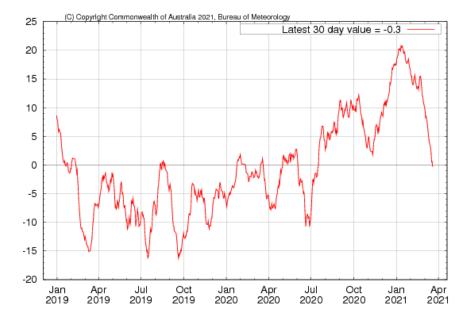
Weekly average: 14 March 2021 http://www.bom.gov.au/climate Created: 15/03/2021

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

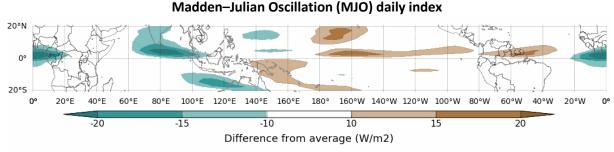


Atmospheric indicators suggest an easing of the La Niña event and a potential return to neutral conditions. Trade wind strength has decreased over the past couple of weeks, but remains above average, while cloudiness near the Date Line remains below average. For the period ending 21 March the 30-day Southern Oscillation Index (SOI) value was -0.3 and for the period ending 14 March the 90-day value was 13.1. The SOI values have been declining since January. The 30-day SOI has dropped below the La Niña threshold value of +7, while the 90-day SOI has trended down but remains above the threshold. The SOI values indicate a likely return to neutral conditions.

### 30-day Southern Oscillation Index (SOI) values ending 21 March 2021



As at 23 March 2021 the Madden-Julian Oscillation (MJO) is weak and currently located away from the Australian region. However, climate models predict the MJO will strengthen and move to the north of Australia near the end of March. The MJO is a pulse of cloud and rainfall that moves eastward along the equator. The presence of the MJO north of Australia is likely to result in above average cloudiness and rainfall across northern Australia.

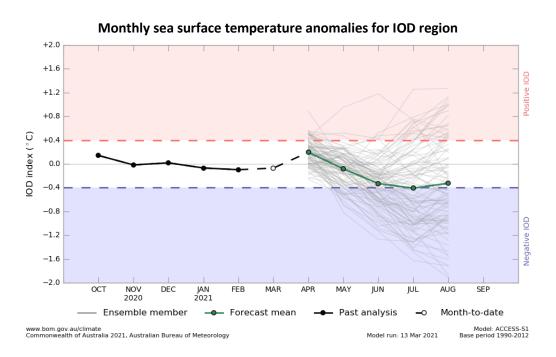


www.bom.gov.au/climate

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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.

Sea surface temperatures across the Indian Ocean have been warmer than average, with a warm body of water off Western Australia potentially influencing local weather conditions. The Indian Ocean Dipole (IOD) is currently neutral with the potential to reach the negative IOD threshold (-0.4) by July. IOD values at or below -0.4 must be sustained for eight weeks for this to be considered a negative IOD event. Three of the five international models surveyed are expected to reach or exceed negative IOD thresholds by July; however, accuracy of the models at this time of year is lower than at other times. A negative IOD is associated with above average winter and spring rainfall across southern Australia, as well as the far north. It is also associated with an early northern rainfall onset.



#### 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 <a href="http://www.bom.gov.au/climate/ahead/about/">http://www.bom.gov.au/climate/ahead/about/</a>

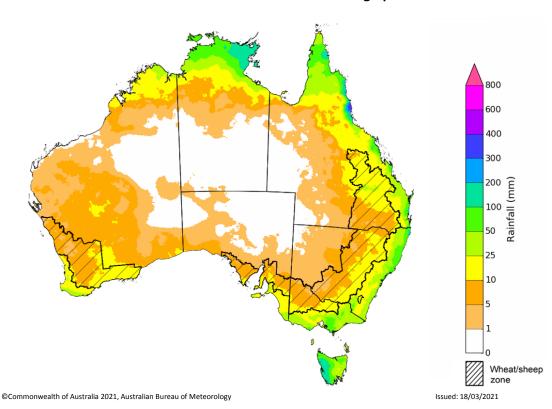
The latest rainfall outlook released by the Bureau of Meteorology suggests that wetter than average conditions are more likely for parts of northern and eastern Australia during April 2021, consistent with the continuing influence of the weakening La Niña event.

The outlook for April 2021 indicates that there is a 75% chance of rainfall totals between 10 and 100 millimetres across parts of the eastern coast of Australia, southern Victoria, south-western Western Australia, eastern Tasmania and far northern Australia. Rainfall totals in excess of 100 millimetres are expected across isolated parts of north-eastern Queensland, the far north of the Northern Territory and western Tasmania.

Across cropping regions there is a 75% chance of rainfall totals between 5 and 10 millimetres in parts of western New South Wales, southern Queensland, northern Victoria, western and central Western Australian cropping regions and most South Australian cropping regions. There is a 75% chance of rainfall totals between 10 and 25 millimetres across cropping regions in parts of eastern New South Wales, central and northern Queensland, southern Victoria, far southern South Australia and eastern Western Australian cropping regions.

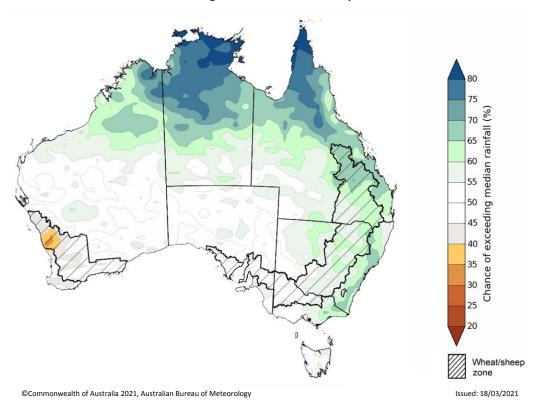
The ACCESS-S climate model suggests there is a 50% chance of recording average or better April rainfall totals across most of Australia, including the major cropping regions. This would suggest that it is less likely that cropping regions in western Victoria and South Australia would experience a repeat of last season's early autumn break in April which facilitated widespread planting of winter crop under ideal sowing conditions.

#### Rainfall totals that have a 75% chance of occurring April 2021



The rainfall outlook for April to June 2021 suggests there is a greater than 60% chance of above average rainfall across much of northern Australia and parts of eastern Australia. There is less than a 40% chance of exceeding median rainfall in isolated parts of south-western Western Australia (Bureau of Meteorology 'National Climate Outlook', 18 March 2021). Bureau of Meteorology rainfall outlooks for April to June have greater than 65% past accuracy across much of the eastern two-thirds of Australia. The outlooks have greater than 75% past accuracy for parts of southern and far northern Queensland, central South Australia, and north-western Western Australia and the north and southeast of the Northern Territory.

# Chance of exceeding the median rainfall April to June 2021

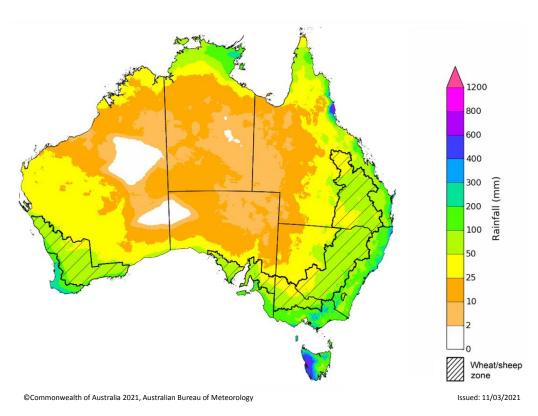


The outlook for April to June 2021 suggests there is a 75% chance of rainfall totals between 25 and 100 millimetres across much of eastern and south-western Australia and parts of far southern and far northern Australia. Rainfall totals in excess of 100 millimetres are likely across parts of eastern New South Wales, eastern Queensland, southern Victoria, south-eastern South Australia, south-western Western Australia, the north of the Northern Territory and Tasmania.

Across cropping regions, there is a 75% chance of receiving between 50 and 100 millimetres across most cropping regions. Lower totals of between 25 and 50 millimetres are expected across cropping regions in parts of south-western New South Wales, south-western and northern Queensland, northern Victoria, north-eastern South Australian cropping regions and central Western Australian cropping regions between April and June 2021.

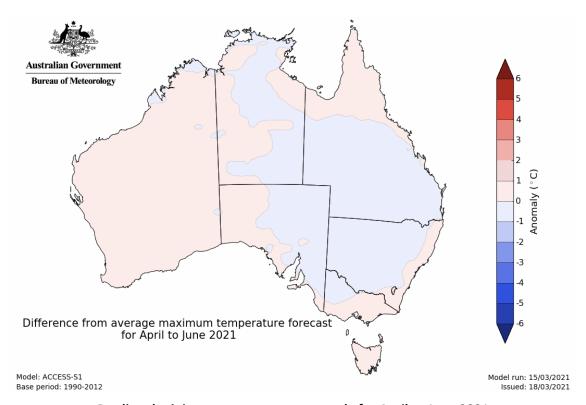
There is a 50% chance of recording average or better April to June rainfall across most winter cropping regions. Given the average or better soil moisture levels across cropping regions in much of New South Wales, South Australia and Western Australia, these falls will likely support average or better pasture growth, as well as the planting of winter crops.

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

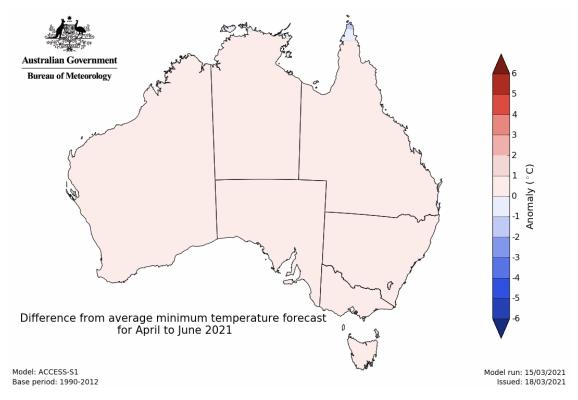


The temperature outlook for April to June 2021 indicates that day-time and night-time temperatures across most of Australia are likely to be close to the 1990-2012 average (- 1°C to 1°C) (Bureau of Meteorology 'National Climate Outlook', 18 March 2021).

# Predicted maximum temperature anomaly for April to June 2021



Predicted minimum temperature anomaly for April to June 2021



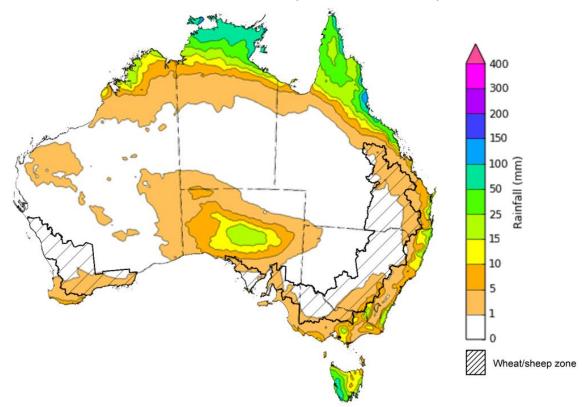
# 1.5. Rainfall forecast for the next eight days

Troughs, onshore winds and cold fronts are expected to generate showers and storms over parts of northern, eastern and southern Australia during the next 8 days.

Rainfall totals of between 10 and 25 millimetres are forecast for parts of eastern New South Wales, northern and eastern Queensland, eastern Victoria, central South Australia, northern Western Australia, the north of the Northern Territory and Tasmania. Rainfall totals in excess of 25 millimetres are forecast for parts of northern Australia and western Tasmania.

In Australia's cropping regions, rainfall of between 1 and 10 millimetres is expected for parts of south-eastern New South Wales, northern and eastern Queensland, southern Victoria, South Australia and southern Western Australia. Following an early autumn break across most winter cropping regions in western and eastern Australia, these low rainfall totals will likely allow farmers to begin sowing winter forage crops.

Total forecast rainfall (mm) for the period 25 March to 1 April 2021



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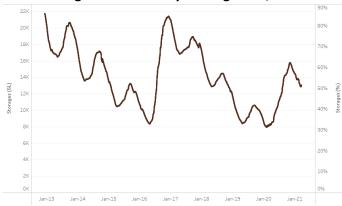
Note: This rainfall forecast is produced from computer models. As the model outputs are not altered by weather forecasters, it is important to check local forecasts and warnings issued by the Bureau of Meteorology.

# 2. Water

# 2.1. Water markets - current week

Water storage in the Murray–Darling Basin (MDB) increased by 177 gigalitres (GL) between 17 March 2021 and 24 March 2021. The current volume of water held in storage is 13,041 GL, which represents 52% of total capacity. This is 58% or 4,788 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 \$100 per ML to \$69 per ML between 18 March 2021 and 25 March 2021. Prices are lower in the Murrumbidgee due to binding of the Murrumbidgee export limit.

Region	\$/ML
NSW Murray Above	70
NSW Murrumbidgee	45
VIC Goulburn-Broken	75
VIC Murray Below	69

# 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 25 March 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 <a href="http://www.agriculture.gov.au/abares/products/weekly\_update/weekly-update-250321">http://www.agriculture.gov.au/abares/products/weekly\_update/weekly-update-250321</a>

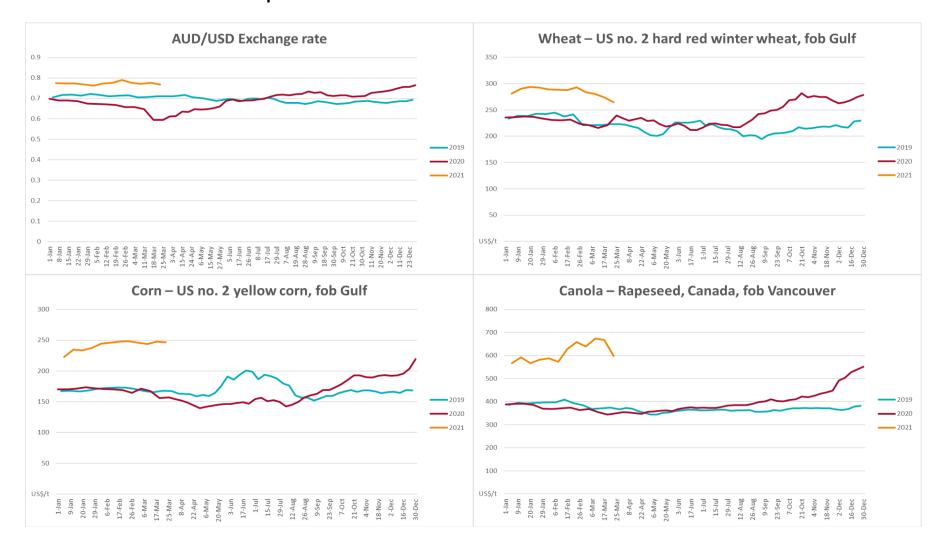
# 3. Commodities

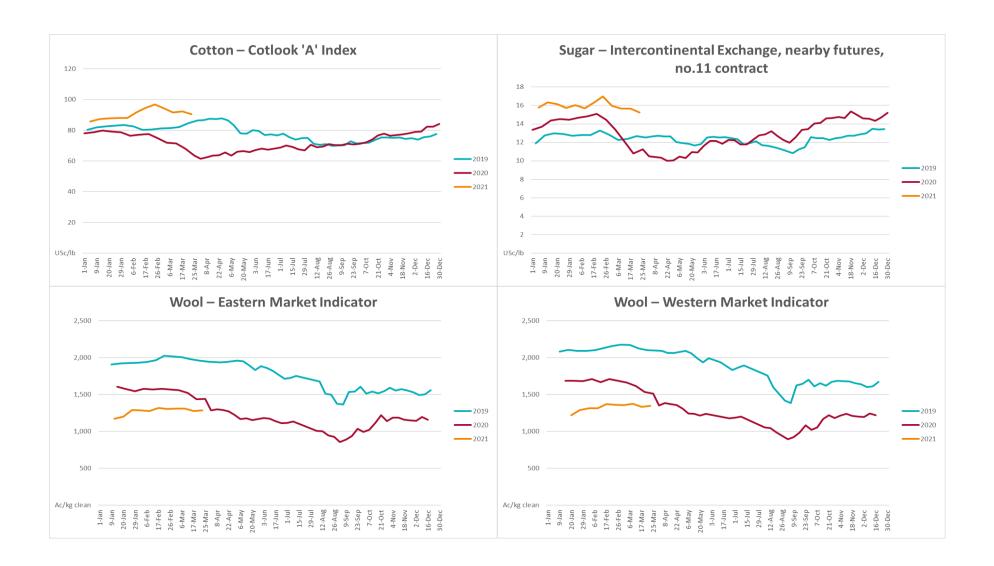
Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
Selected world indicator prices							
AUD/USD Exchange rate	24-Mar	A\$/US\$	0.77	0.78	-1%	0.61	25%
Wheat – US no. 2 hard red winter wheat, fob Gulf	24-Mar	US\$/t	265	274	-3%	234	13%
Corn – US no. 2 yellow corn, fob Gulf	24-Mar	US\$/t	246	248	-1%	154	60%
Canola – Rapeseed, Canada, fob Vancouver	24-Mar	US\$/t	599	668	-10%	354	69%
Cotton – Cotlook 'A' Index	24-Mar	USc/lb	91	92	-2%	61	47%
Sugar – Intercontinental Exchange, nearby futures, no.11 contract	24-Mar	USc/lb	15	16	-3%	10	45%
Wool – Eastern Market Indicator	24-Mar	Ac/kg clean	1,285	1,277	1%	1,568	-18%
Wool – Western Market Indicator	24-Mar	Ac/kg clean	1,346	1,333	1%	1,671	-19%
Selected Australian grain export prices							
Milling Wheat – APW, Port Adelaide, SA	24-Mar	A\$/t	355	356	0%	430	-17%
Feed Wheat – ASW, Port Adelaide, SA	24-Mar	A\$/t	353	354	0%	426	-17%
Feed Barley – Port Adelaide, SA	24-Mar	A\$/t	301	301	0%	338	-11%
Canola – Kwinana, WA	24-Mar	A\$/t	663	672	-1%	662	0%
Grain Sorghum – Brisbane, QLD	24-Mar	A\$/t	363	364	0%	472	-23%
Selected domestic livestock indicator prices							
Beef – Eastern Young Cattle Indicator	24-Mar	Ac/kg cwt	868	856	1%	496	75%
Mutton – Mutton indicator (18–24 kg fat score 2–3), Vic	24-Mar	Ac/kg cwt	671	646	4%	733	-8%
Lamb – Eastern States Trade Lamb Indicator	17-Mar	Ac/kg cwt	824	827	0%	762	8%
Pig – Eastern Seaboard (60.1–75 kg), average of buyers & sellers	10-Mar	Ac/kg cwt	347	357	-3%	386	-10%
Goats – Eastern States (12.1–16 kg)	10-Mar	Ac/kg cwt	815	813	0%	893	-9%
Live cattle – Light steers ex Darwin to Indonesia	03-Feb	Ac/kg lwt	355	355	0%	335	6%
Live sheep – Live wethers (Muchea WA saleyard) to Middle East	18-Nov	\$/head	118	108	9%	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 <sup>a</sup>							
Dairy – Whole milk powder	17-Mar	US\$/t	4,083	4,364	-6%	3,027	35%
Dairy – Skim milk powder	17-Mar	US\$/t	3,350	3,302	1%	2,534	32%
Dairy – Cheddar cheese	17-Mar	US\$/t	4,250	4,280	-1%	3,565	19%
Dairy – Anhydrous milk fat	17-Mar	US\$/t	6,155	5,929	4%	5,579	10%

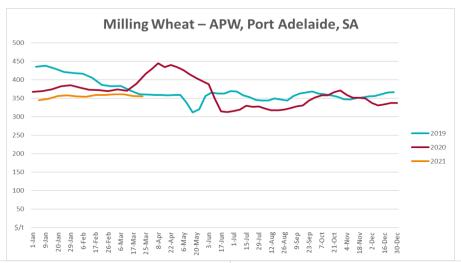
**a** Global Dairy Trade prices are updated twice monthly on the first and third Tuesday of each month.

# 3.1. Selected world indicator prices





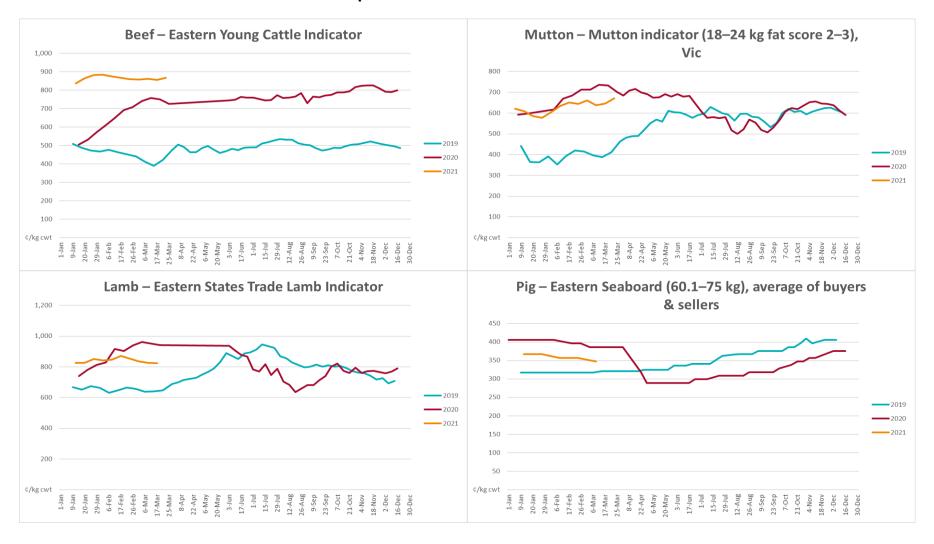
# **3.2.** Selected domestic crop indicator prices

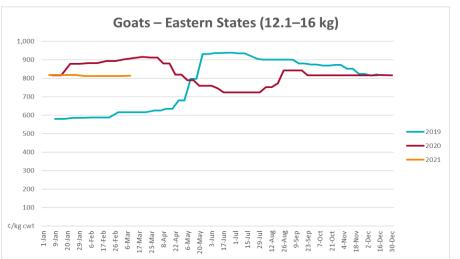


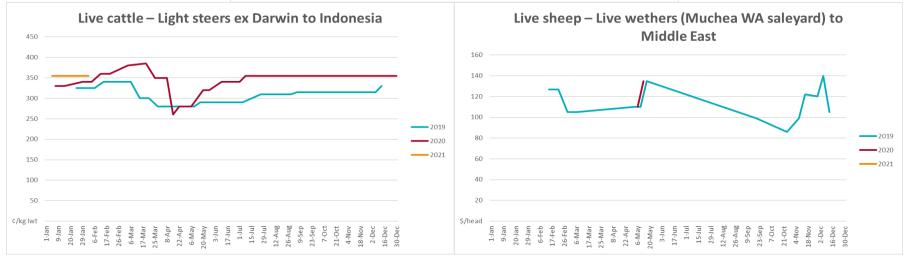




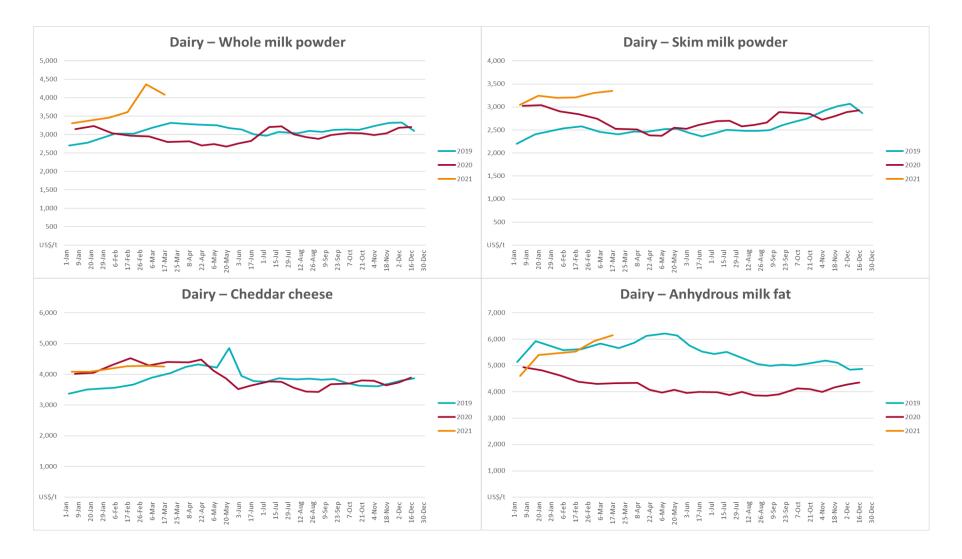
# 3.3. Selected domestic livestock indicator prices



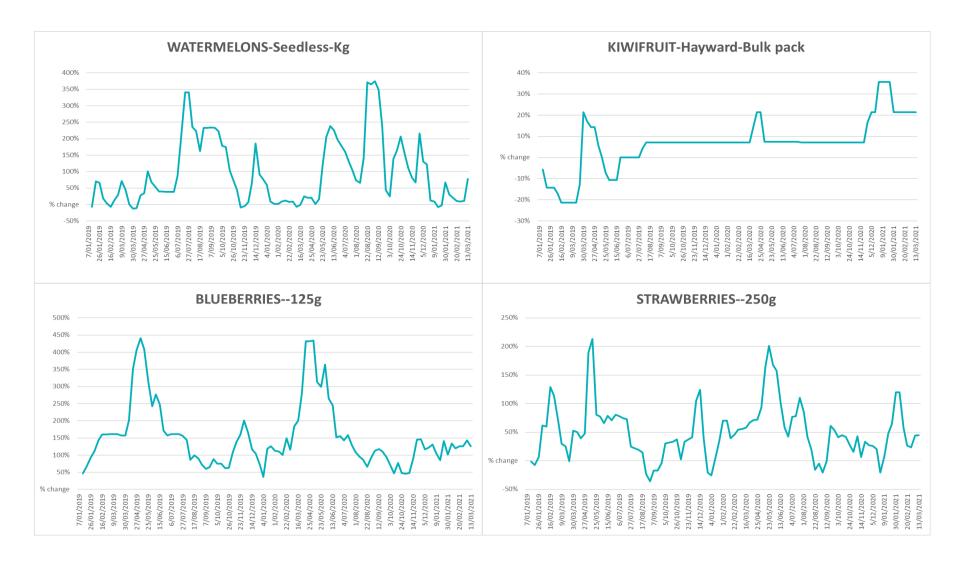


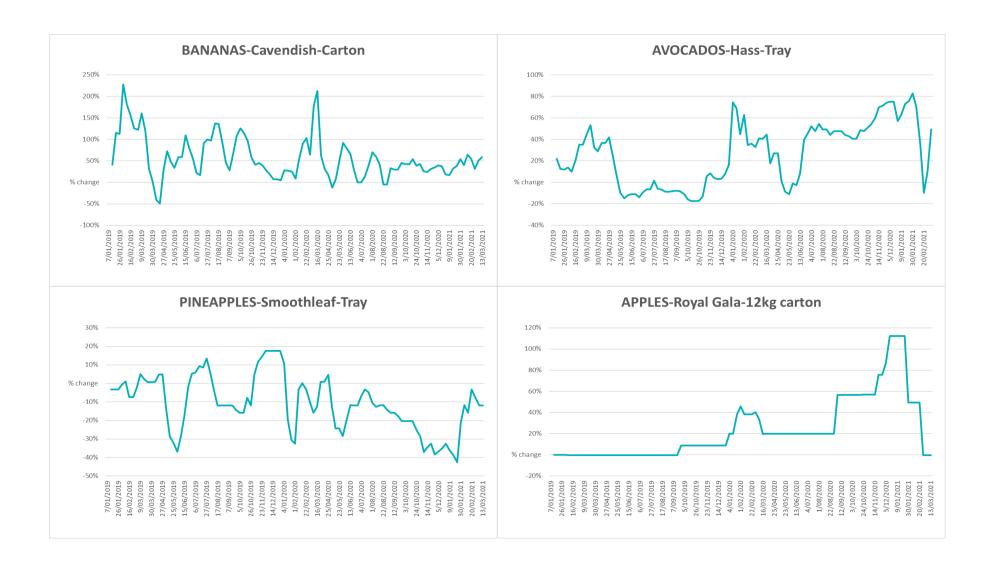


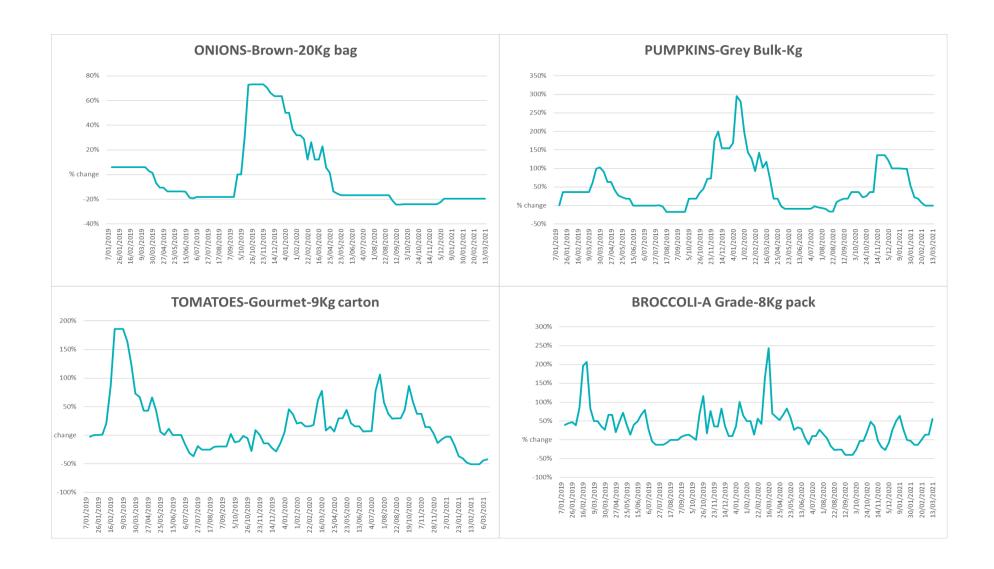
# 3.4. Global Dairy Trade (GDT) weighted average prices

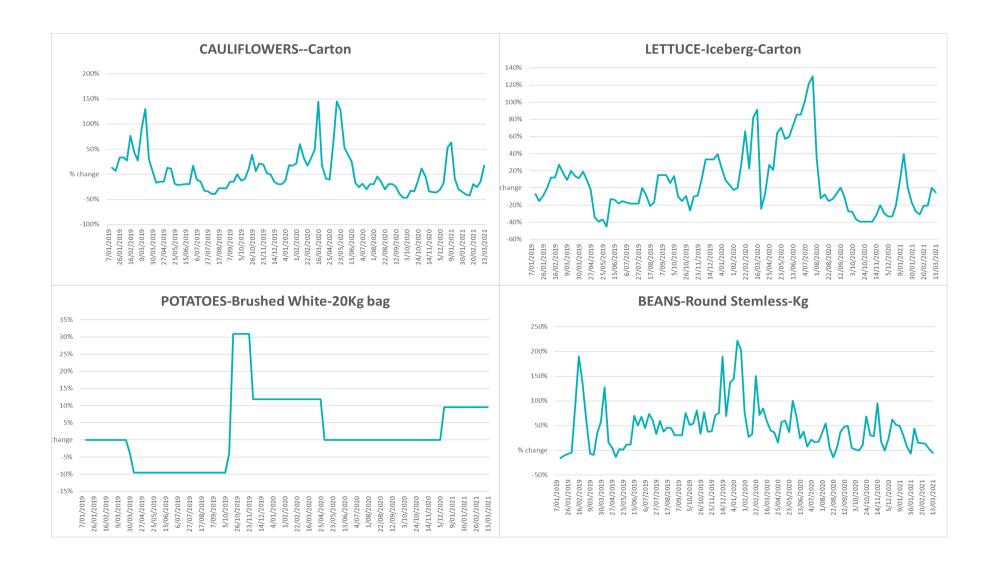


# 3.5. Selected fruit and vegetable prices









# 4. Data attribution

#### Climate

#### Bureau of Meteorology

- Weekly rainfall totals: <a href="www.bom.gov.au/jsp/awap/rain/index.jsp">www.bom.gov.au/jsp/awap/rain/index.jsp</a>
- Monthly and last 3-month rainfall percentiles: <a href="www.bom.gov.au/jsp/awap/rain/index.jsp">www.bom.gov.au/jsp/awap/rain/index.jsp</a>
- Temperature anomalies: <u>www.bom.gov.au/jsp/awap/temp/index.jsp</u>
- Rainfall forecast: <a href="www.bom.gov.au/jsp/watl/rainfall/pme.jsp">www.bom.gov.au/jsp/watl/rainfall/pme.jsp</a>
- Seasonal outlook: <u>www.bom.gov.au/climate/outlooks/#/overview/summary/</u>
- Drought statement: <u>www.bom.gov.au/climate/drought/drought.shtml</u>
- Soil moisture: www.bom.gov.au/water/landscape/

#### Other

- Pasture growth: <a href="https://www.longpaddock.qld.gov.au/aussiegrass/">https://www.longpaddock.qld.gov.au/aussiegrass/</a>
- 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: <a href="https://ipad.fas.usda.gov/ogamaps/cropmapsandcalendars.aspx">https://ipad.fas.usda.gov/ogamaps/cropmapsandcalendars.aspx</a>
- Autumn break: Pook et al., 2009, <a href="https://rmets-onlinelibrary-wiley-com.virtual.anu.edu.au/doi/epdf/10.1002/joc.1833">https://rmets-onlinelibrary-wiley-com.virtual.anu.edu.au/doi/epdf/10.1002/joc.1833</a>

#### Water

#### **New South Wales**

- New South Wales Water Information: <a href="http://waterinfo.nsw.gov.au/">http://waterinfo.nsw.gov.au/</a>
- New South Wales Office of Water, Department of Primary Industries: <u>www.water.nsw.gov.au/Home/default.aspx</u>
- Available water determinations register: <u>www.water.nsw.gov.au/water-licensing/registers</u>

#### Queensland

- Sunwater: <u>www.sunwater.com.au</u>
- Seqwater: http://seqwater.com.au

#### South Australia

- SA Water: www.sawater.com.au/community-and-environment/the-river-murray/river-reports/daily-flow-report
- South Australian Department of Environment, Water and Natural Resources: <u>www.environment.sa.gov.au</u>

#### Victoria

Goulburn–Murray Water: www.g-mwater.com.au

#### **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: www.globaldairytrade.info/en/product-results/

# 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: <u>www.awex.com.au/</u>

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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