Australian Government
Department of Agriculture, Water and the Environment
ABARES

Weekly Australian Climate, Water and Agricultural Update

No. 37/2021

23 September 2021

Summary of key issues

- During the week ending 22 September 2021, high pressure systems and weak frontal activity across southern Australia resulted in little rainfall across much of the continent. Weak frontal systems brought rainfall to western Tasmania, parts of southern New South Wales, southern Victoria, the far southeast of South Australia and the southwest of Western Australia (see Section 1.1).
- Cropping regions in northern and eastern Western Australia and parts of South Australia have seen little to no rainfall during September. This coupled with above average temperatures have seen a rapid drying of soil moisture profiles and are likely to lower yield expectations in these regions.
- The negative Indian Ocean Dipole event that was officially declared by the Bureau of Meteorology in July, has weakened though September. However, the pattern of sea surface temperatures in the Indian Ocean remains likely to influence the chances of above-average spring rainfall for much of southern and eastern Australia. The Southern Annular Mode has been positive over the past three weeks and is forecast to remain positive and may continue to have a negative influence on rainfall across southern Australian the coming weeks (see Section 1.2).
- The outlook for October 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 alpine regions of New South Wales and Victoria, as well as the west coast of Tasmania (see Section 1.3).
- The outlook for October to December suggests there is a 75% chance of rainfall totals between 50 and 200 millimetres across much of New South Wales, Queensland, Victoria, the Northern Territory and Tasmania, as well as parts of South Australia and the far south and north of Western Australia. Rainfall totals in excess of 300 millimetres are likely across parts of alpine and coastal regions of New South Wales and Victoria, as well as parts of Queensland, the north of the Northern Territory and western Tasmania.
- High pressure systems are likely to bring clear skies and dry conditions across much of Australia over the next eight days. Parts of southern Australia are expected to receive rainfall as a low-pressure system moves across the country towards the end of next week. Given the rapid drying of soil moisture profile in South Australia, and northern and eastern Western Australia, further rainfall will be required in coming weeks to halt the recent decline in yield prospects particularly across parts of Western Australia (see Section 1.4).
- Water storage in the Murray–Darling Basin (MDB) increased by 77 gigalitres (GL) between 15 September 2021 and 22 September 2021. The current volume of water held in storage is 21,329 GL, which represents 84% of total capacity. This is 48% or 6,953 GL more than at the same time last year.
- Allocation prices in the Victorian Murray below the Barmah Choke increased from $129 per ML on 10 September 2021 to $139 per ML on 17 September 2021. 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

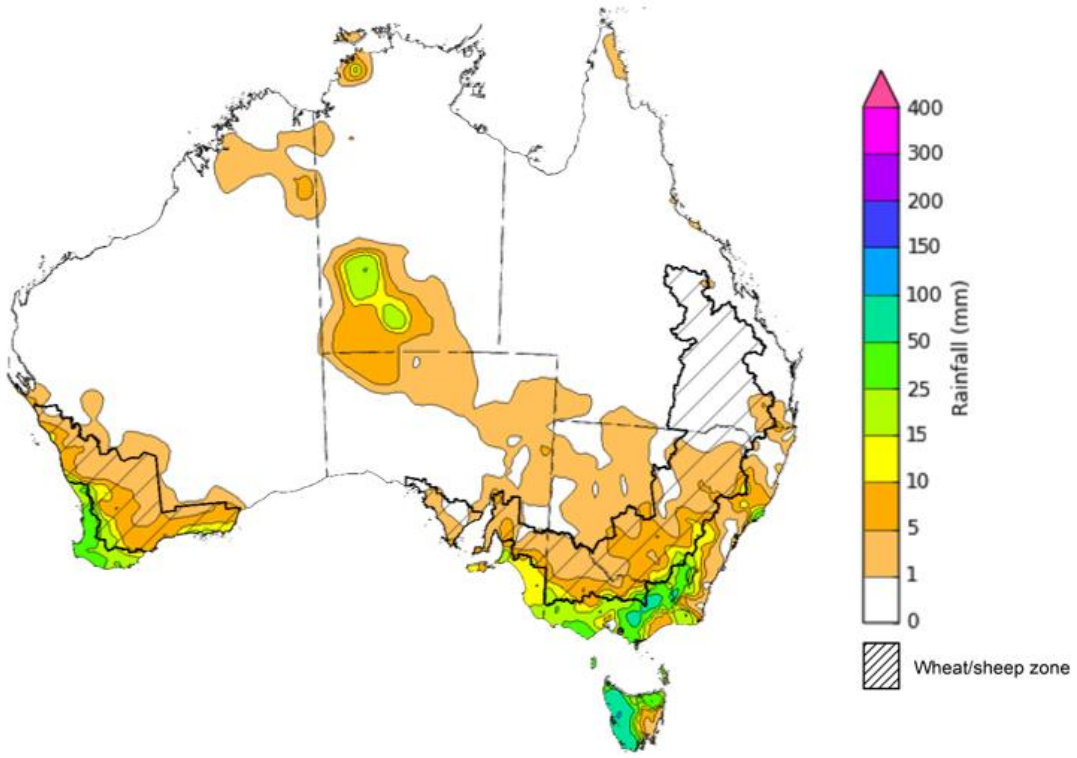
During the week ending 22 September 2021, high pressure systems and weak frontal activity across southern Australia resulted in little rainfall across much of the continent. Weak frontal systems brought rainfall to western Tasmania, parts of southern New South Wales, southern Victoria, the far southeast of South Australia and the southwest of Western Australia. Isolated thunderstorms developed near a surface trough and produced moderate falls over parts of central Australia.

Rainfall totals of between 10 and 50 millimetres were recorded across southern ranges of New South Wales, southern and eastern Victoria, the far southwest of Western Australia, much of Tasmania and the far southeast of South Australia. Rainfall totals in excess of 50 millimetres were recorded across alpine regions of New South Wales and Victoria, and western Tasmania.

In cropping regions, rainfall totals of between 5 and 15 millimetres were recorded across parts of southern New South Wales, Victoria and Western Australia. Little to no rainfall was recorded in remaining cropping regions in New South Wales, Victoria and Western Australia as well as most cropping regions in Queensland and South Australia.

Soil moisture levels have been average to above average across most cropping regions which likely supported ongoing crop development over the past week. However, cropping regions in northern and eastern Western Australia and parts of South Australia have seen little to no rainfall during September. This coupled with above average temperatures have seen a rapid drying of soil moisture profiles and are likely to lower yield expectations in these regions.

Rainfall for the week ending 23 September 2021



 Issued: 22/09/2021

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

1.2. Climate Drivers

Throughout spring 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 final yield prospects for Australia's winter cropping season, pasture growth rates during this peak growth period and planting condition for summer crops.

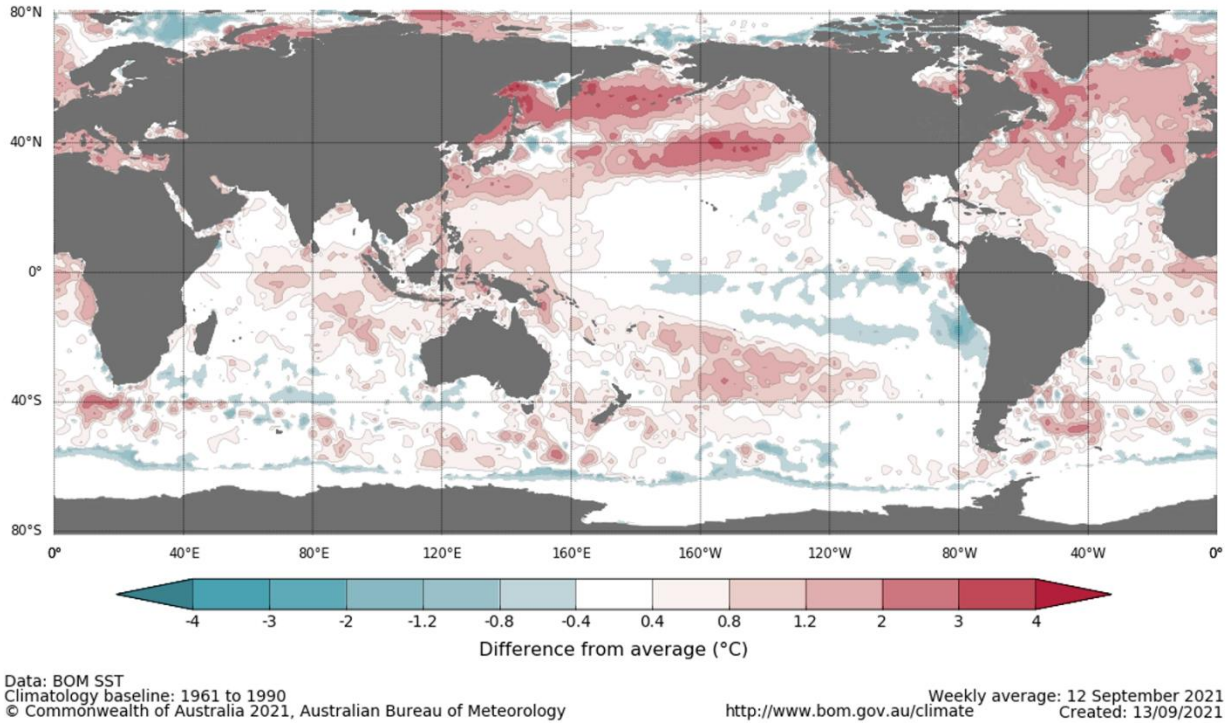
A negative IOD event that was officially declared by the Bureau of Meteorology in July, has weakened though September, with IOD values at marginal negative IOD levels. However, the pattern of sea surface temperatures in the Indian Ocean remains likely to influence Australian rainfall over the coming months. The SAM index has been positive over the past three weeks and is forecast to remain positive for several weeks to come. This is supported by a strengthened polar vortex over Antarctica. The positive SAM has likely contributed to the dry conditions seen across parts of southern Australia during September.

Oceanic and atmospheric indicators show ENSO conditions remain neutral. However, strengthening model outlooks and recent cooling in the tropical Pacific Ocean have raised the chance of a La Niña forming in 2021. Most international climate models surveyed by the Bureau of Meteorology indicate central Pacific sea surface temperatures are likely to cool over the coming months, with three of the seven models suggesting the cooling will be sufficient, and sustained for long enough, to meet minimum La Niña event criteria. The remaining models predict neutral ENSO conditions to persist through to early 2022.

Sea surface temperature (SSTs) anomalies have been close to average across the tropical Pacific Ocean over the previous week, with small areas of slightly cooler than average SSTs in the central to eastern equatorial Pacific. Warm anomalies in the western Pacific have decreased slightly, including waters near the Maritime Continent and close to Australia.

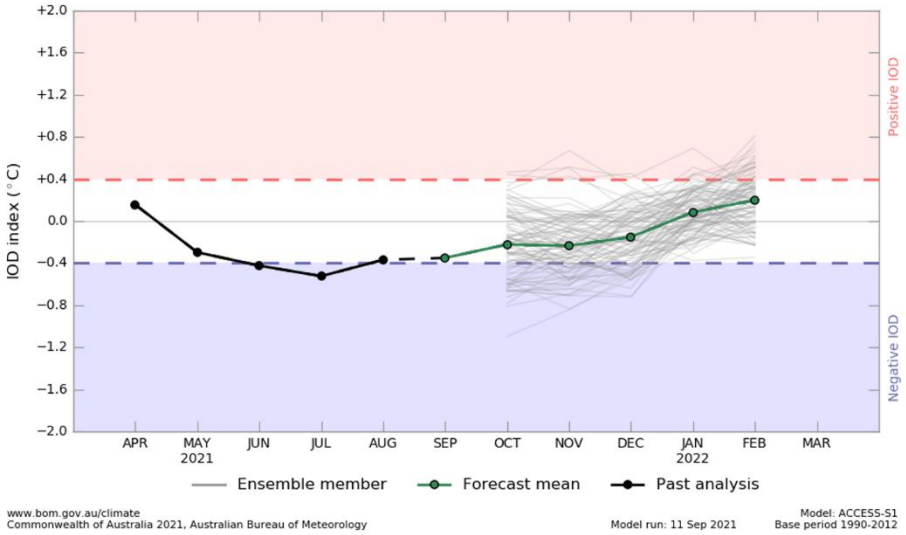
Warm sea surface temperature anomalies have weakened slightly near Western Australia and Indonesia. Meanwhile, sea surface temperatures in the western Indian Ocean have cooled slightly over the past week. The continuation of warm anomalies in the eastern Indian Ocean and the ocean surrounding Australia reflect the ongoing negative IOD event.

Difference from average sea surface temperature observations 6 September to 12 September 2021



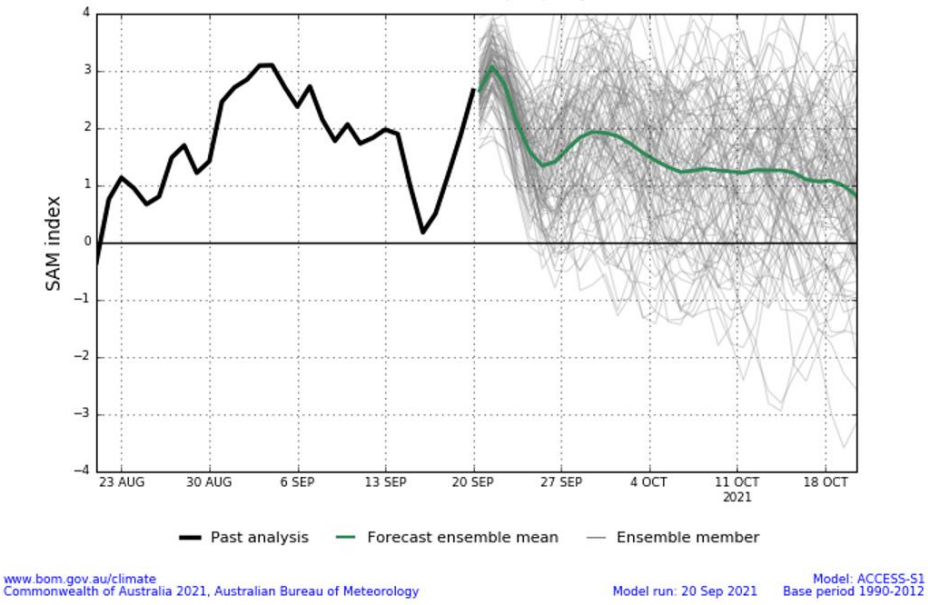
As at 12 September, the Indian Ocean Dipole (IOD) weekly value was -0.37°C, which would be considered a neutral IOD value and is not forecast to return below the negative threshold of (-0.4°C) during the remainder of spring. This sea surface temperature pattern increases the chance of above average rainfall for southern and eastern Australia and the far north during winter and spring and is typically associated with an early onset of northern rainfall. It also increases the chances of below average maximum temperatures in southern Australia, while increasing the chances of above average minimum and maximum temperatures in northern Australia.

Monthly sea surface temperature anomalies for IOD region



The Southern Annular Mode (SAM) is currently positive and expected to remain positive for 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. When SAM is positive during winter, the band of westerly winds is further south than normal. A negative SAM in winter is associated with increased rainfall for northern New South Wales, southern Queensland and southern parts of South Australia and Western Australia. It is also associated with decreased rainfall for much of Victoria, the west of Western Australia and Tasmania.

Southern Annular Mode (SAM) daily index



1.3. National Climate Outlook

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

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

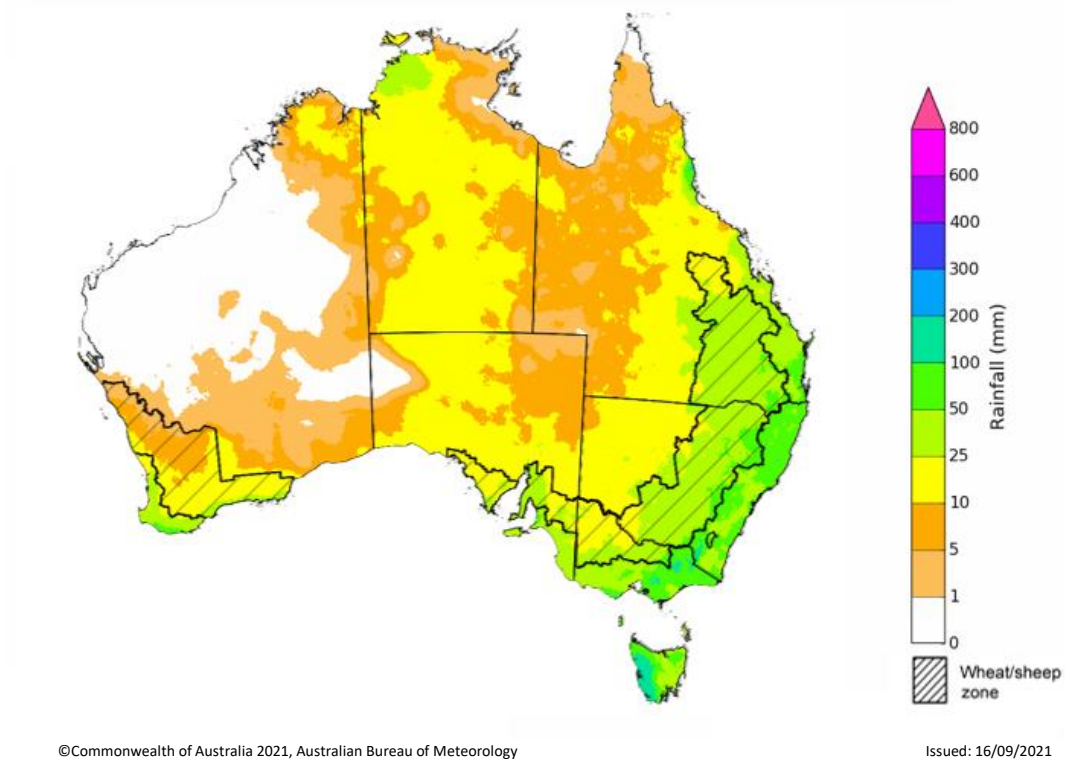
The Bureau of Meteorology's latest rainfall outlook indicated wetter than average conditions are expected for much of eastern Australia and average rainfall is expected for Western Australia during October. The wetter than average conditions expected for eastern cropping regions reaffirms the positive production outlook for Australia's 2021 winter cropping season and will support the establishment of summer crops. The ACCESS-S climate model suggests there is close to a 70% chance of exceeding average October rainfall totals across much of eastern and central Australia.

The outlook for October 2021 indicates that there is a 75% chance of rainfall totals between 10 and 100 millimetres across eastern, central, south-western and far southern Australia. Rainfall totals in excess of 100 millimetres are expected across alpine regions of New South Wales and Victoria, as well as the west coast of Tasmania.

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

The dryer than average conditions expected in Western Australian cropping regions are unlikely to see an improvement in current yield prospects but will aid harvesting of winter crops which are likely to commence in October. Meanwhile, the wetter than average conditions in eastern states will support yield potentials for late sown winter crops and support the planting of dryland summer crops

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

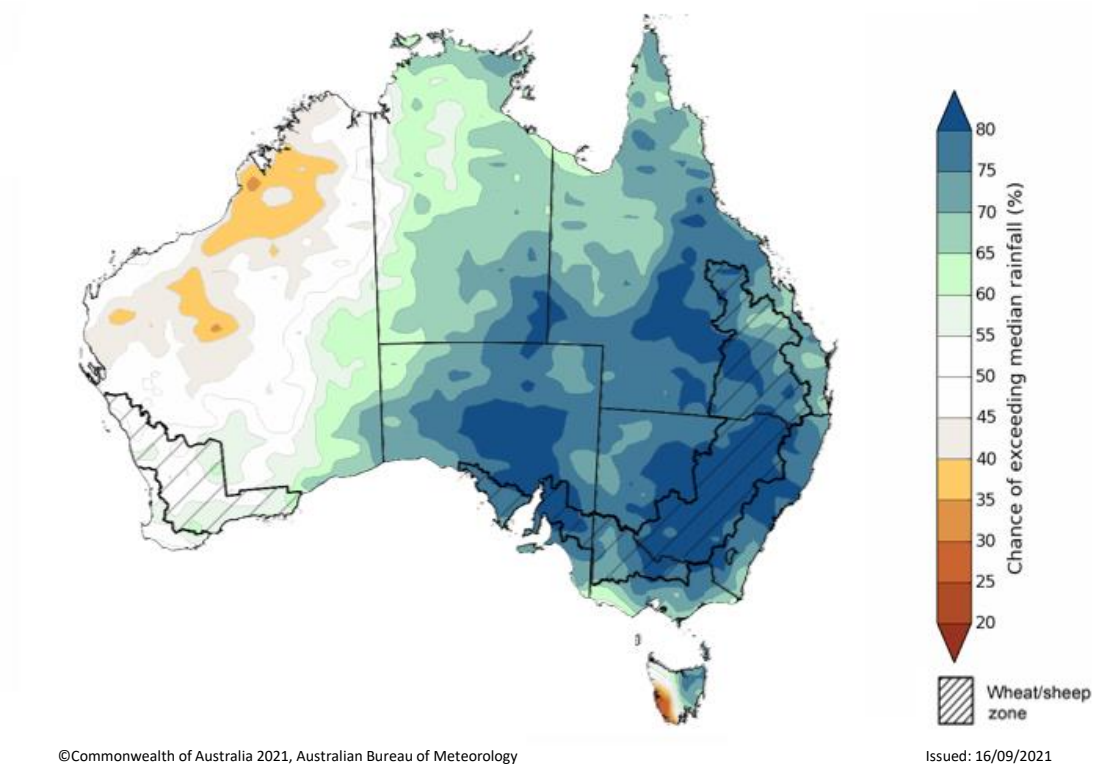


Issued: 16/09/2021

The rainfall outlook for October to December suggests there is a greater than 75% chance of exceeding average rainfall across much of New South Wales, central and southern Queensland, Victoria, South Australia, parts of the Northern Territory and eastern Tasmania. There is less than a 40% chance of exceeding average rainfall in south-western Tasmania, but no strong tendency toward above or below average rainfall across the much of Western Australia (Bureau of Meteorology 'National Climate Outlook', 16 September 2021).

Bureau of Meteorology rainfall outlooks for October to December have greater than 55% past accuracy across most of Australia. Outlook accuracy is greater than 65% for parts of New South Wales, Queensland, Victoria, South Australia, Western Australia, the Northern Territory and Tasmania. On the other hand, there is low past accuracy in western and central Western Australia and southern Tasmania.

Chance of exceeding the median rainfall October to December 2021



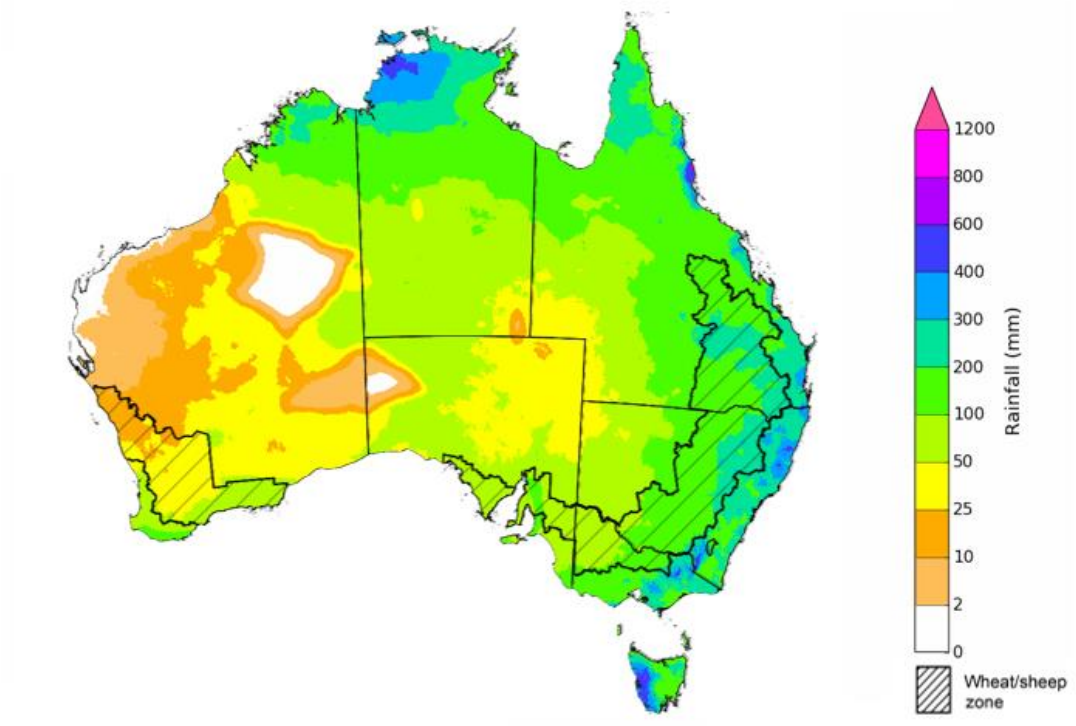
Issued: 16/09/2021

The outlook for October to December suggests there is a 75% chance of rainfall totals between 50 and 200 millimetres across most of New South Wales, Queensland, Victoria, the Northern Territory and Tasmania, as well as parts of South Australia and the far south and north of Western Australia. Rainfall totals in excess of 300 millimetres are likely across parts of alpine and coastal regions of New South Wales and Victoria, as well as parts of Queensland, the north of the Northern Territory and western Tasmania.

Across cropping regions, there is a 75% chance of receiving between 50 and 200 millimetres in New South Wales, Queensland, Victoria, South Australia and southern parts of Western Australia. Rainfall totals in excess of 200 millimetres are forecast for parts of central Queensland and north-eastern New South Wales cropping regions. Totals of less than 50 millimetres are expected across central and northern cropping areas of Western Australia.

These rainfall totals are slightly below average for this three-month period across some Western Australian cropping regions, and average to above aveage for cropping regions of New South Wales, Queensland and Victoria. The expected conditions for eastern states may limit field access and slowdown the winter crop harvest, as well as increasing the potential of grain quality issues. Close to average rainfall totals for Queensland and northern New South Wales will support the germination and establishment of summer sown crops.

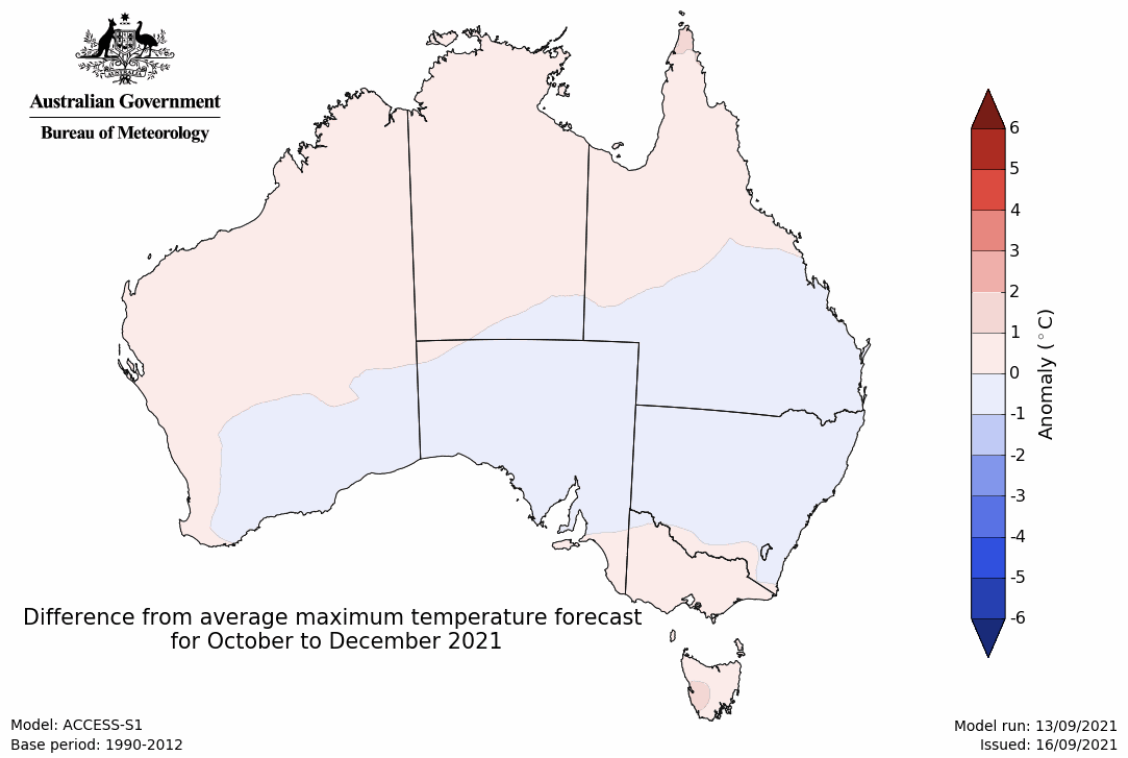
Rainfall totals that have a 75% chance of occurring October to December 2021



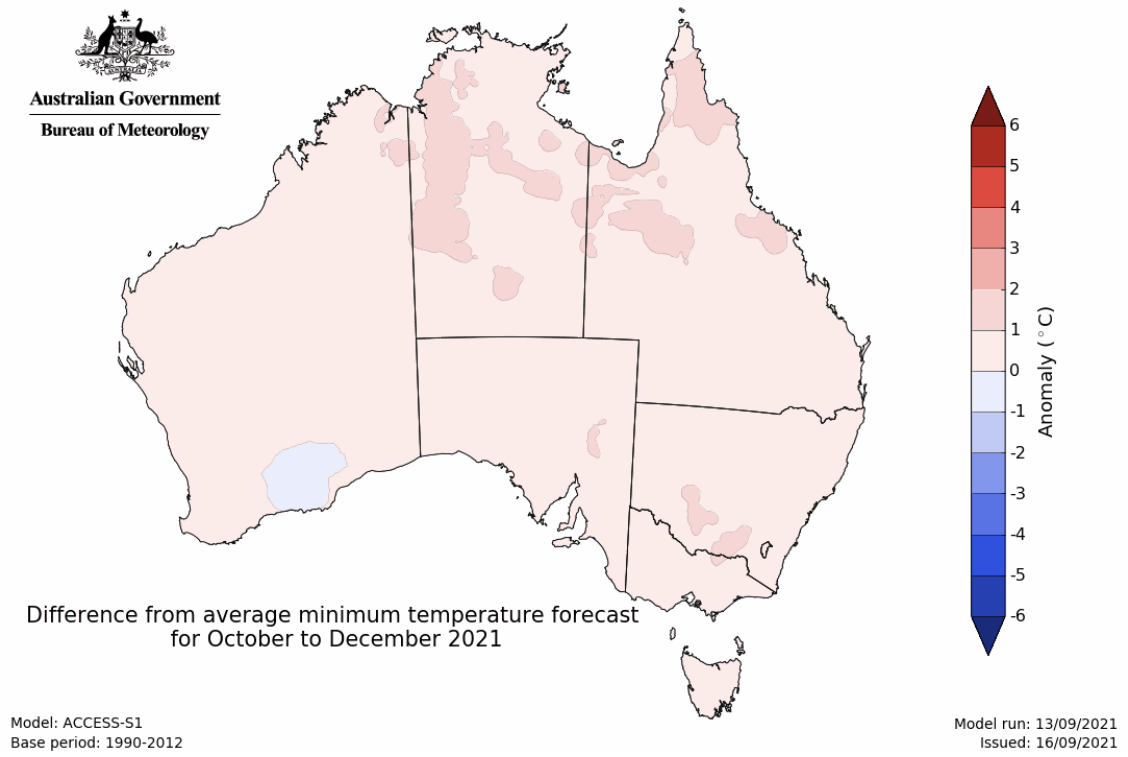
Issued: 16/09/2021

The temperature outlook for October to December 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 parts of northern Queensland, the Northern Territory, southern New South Wales and the east of South Australia (Bureau of Meteorology 'National Climate Outlook', 16 September 2021).

Predicted maximum temperature anomaly for October to December 2021



Predicted minimum temperature anomaly for October to December 2021



1.4. Rainfall forecast for the next eight days

High pressure systems are likely to bring clear skies and dry conditions across much of Australia over the next eight days. Parts of southern Australia are expected to receive rainfall as a low-pressure system moves across the country towards the end of next week.

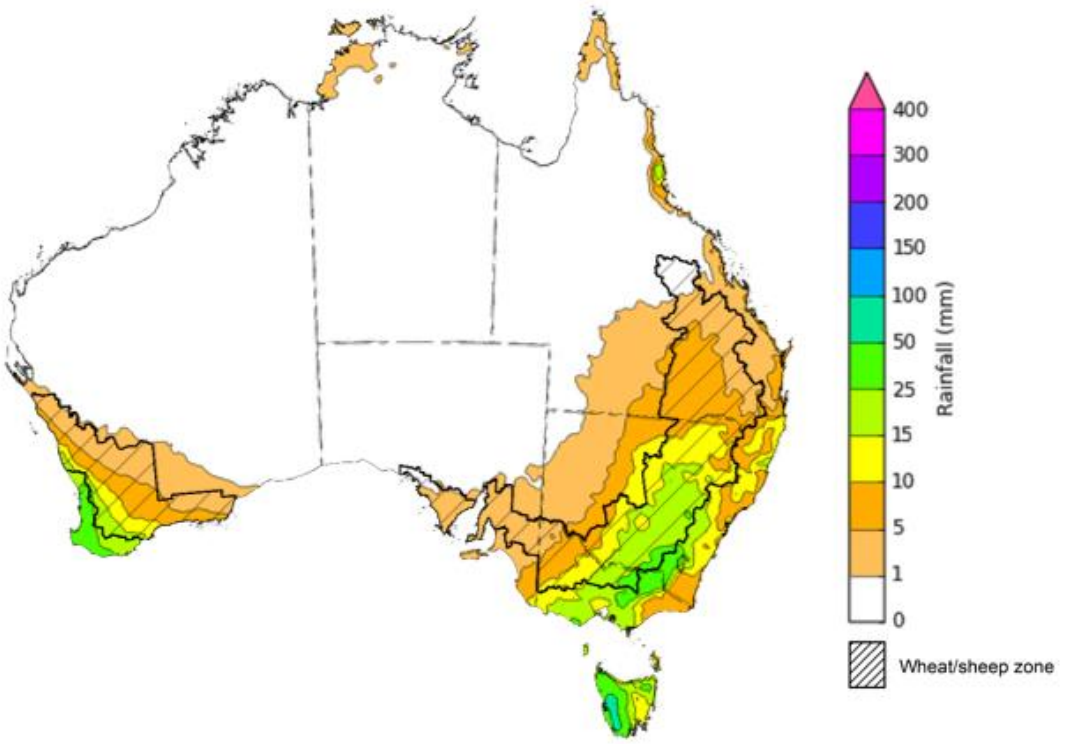
Rainfall totals of between 10 and 50 millimetres are forecast for much of eastern New South Wales, southern and central Victoria, north-east Queensland, the south-west of Western Australia and Tasmania. Rainfall in excess of 50 millimetres is expected in parts of western Tasmania.

In Australian cropping regions, rainfall totals of between 10 and 25 millimetres are expected across much of New South Wales, eastern Victoria and the far southwest of Western Australia. Lower rainfall totals of between 5 and 10 millimetres are expected across parts of southern Queensland, western Victoria, and central Western Australia. Little to no rainfall is forecast for remaining areas in Queensland, northern and eastern Western Australia and much of South Australia during the next 8-days.

Soil moisture levels remain average to above average across most cropping regions in New South Wales, Victoria, southern Queensland and southern Western Australia for this time of year. Despite the lack of rainfall over the past week, and the expectation of another dry week ahead in Queensland and parts of Victoria, winter crop development is expected to continue unimpeded in these areas.

However, a lack of rainfall in South Australia, and northern and eastern Western Australia has led to a rapid drying of the soil moisture profile. Further rainfall will be required through spring as crops enter stages in which they are most sensitive to water deficiencies (flowering and grain filling) to halt the recent decline in yield prospects particularly across parts of Western Australia. The dry conditions in Queensland are continuing to assist cotton planting, with the forecast of a wet spring/summer to support dryland yield potentials.

Total forecast rainfall (mm) for the period 23 September to 30 September 2021



 Issued: 23/09/2021

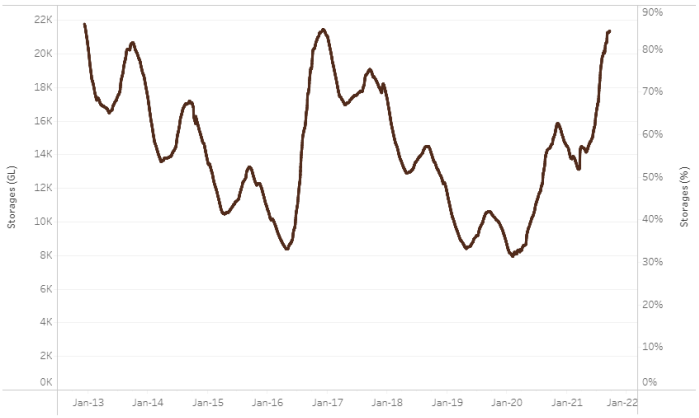
Note: This rainfall forecast is produced from computer models. As the model outputs are not altered by weather forecasters, it is important to check local forecasts and warnings issued by the Bureau of Meteorology.

2. Water

2.1. Water markets – current week

Water storage in the Murray–Darling Basin (MDB) increased by 77 gigalitres (GL) between 15 September 2021 and 22 September 2021. The current volume of water held in storage is 21,329 GL, which represents 84% of total capacity. This is 48% or 6,953 GL more than at the same time last year.

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

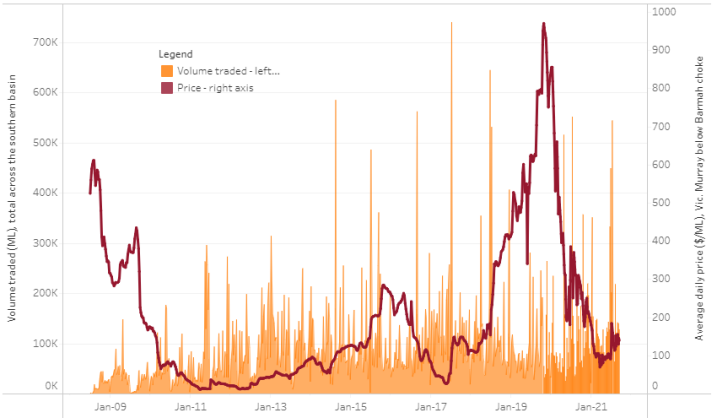


Water storage data is sourced from the Bureau of Meteorology.

Allocation prices in the Victorian Murray below the Barmah Choke increased from $129 per ML on 10 September 2021 to $139 per ML on 17 September 2021. 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	94
NSW Murrumbidgee	111
VIC Goulburn-Broken	106
VIC Murray Below	139

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 23 September2021.

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-230921

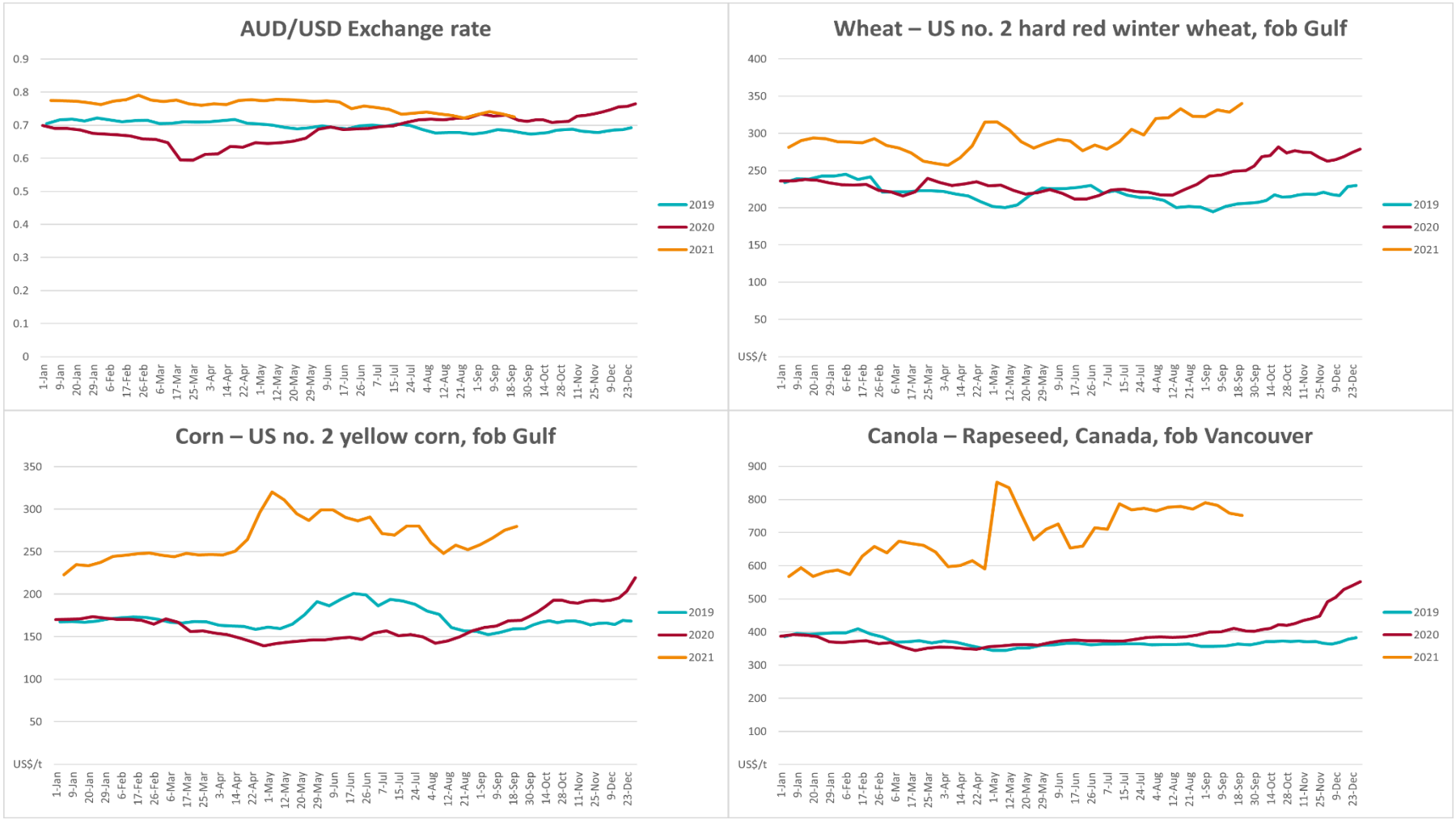
3. Commodities

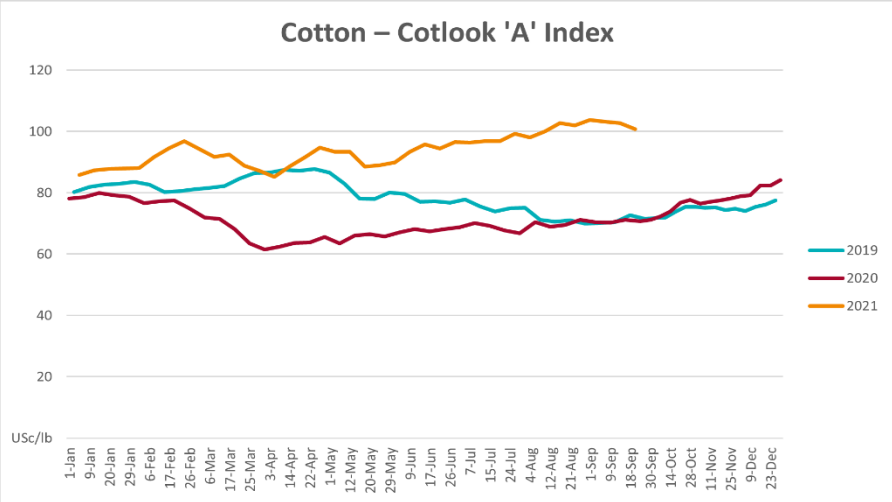
Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
Selected world indicator prices							
AUD/USD Exchange rate	22-Sep	A$/US$	0.73	0.73	-1%	0.71	2%
Wheat – US no. 2 hard red winter wheat, fob Gulf	22-Sep	US$/t	340	328	3%	256	33%
Corn – US no. 2 yellow corn, fob Gulf	22-Sep	US$/t	280	275	2%	173	61%
Canola – Rapeseed, Canada, fob Vancouver	22-Sep	US$/t	751	758	-1%	401	87%
Cotton – Cotlook 'A' Index	22-Sep	USc/lb	101	103	-2%	71	42%
Sugar – Intercontinental Exchange, nearby futures, no.11 contract	22-Sep	USc/lb	19.8	19.7	0%	13	47%
Wool – Eastern Market Indicator	22-Sep	Ac/kg clean	1,368	1,352	1%	1,006	36%
Wool – Western Market Indicator	22-Sep	Ac/kg clean	1,397	1,392	0%	1,214	15%
Selected Australian grain export prices							
Milling Wheat – APW, Port Adelaide, SA	22-Sep	A$/t	430	417	3%	353	22%
Feed Wheat – ASW, Port Adelaide, SA	22-Sep	A$/t	424	416	2%	337	26%
Feed Barley – Port Adelaide, SA	22-Sep	A$/t	349	343	2%	290	20%
Canola – Kwinana, WA	22-Sep	A$/t	869	845	3%	661	31%
Grain Sorghum – Brisbane, QLD	22-Sep	A$/t	366	365	0%	364	1%
Selected domestic livestock indicator prices							
Beef – Eastern Young Cattle Indicator	22-Sep	Ac/kg cwt	1,030	1,026	0%	767	34%
Mutton – Mutton indicator (18–24 kg fat score 2–3), Vic	22-Sep	Ac/kg cwt	621	624	0%	507	23%
Lamb – Eastern States Trade Lamb Indicator	22-Sep	Ac/kg cwt	927	940	-1%	683	36%
Pig – Eastern Seaboard (60.1–75 kg), average of buyers & sellers	08-Sep	Ac/kg cwt	318	318	0%	289	10%
Goats – Eastern States (12.1–16 kg)	15-Sep	Ac/kg cwt	887	895	-1%	773	15%
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

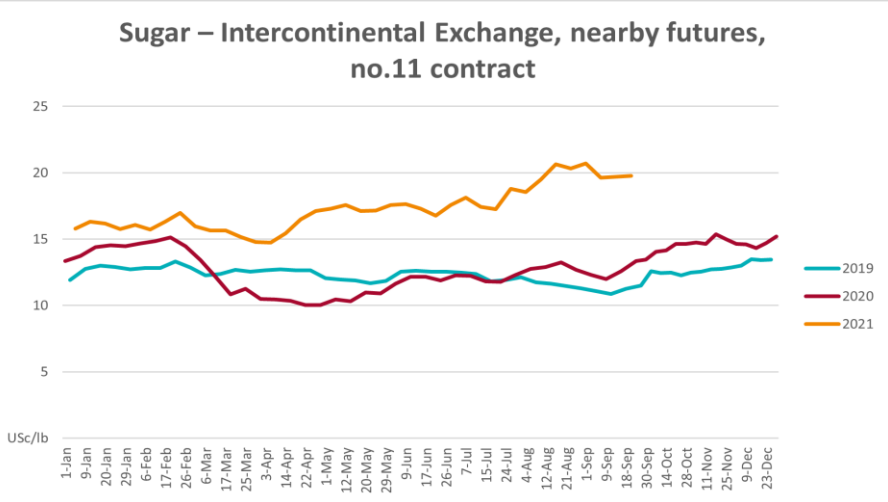
Indicator	Week ended	Unit	Latest price	Previous week	Weekly change	Price 12 months ago	Annual change
Global Dairy Trade (GDT) weighted average prices [a]							
Dairy – Whole milk powder	22-Sep	US$/t	3,777	3,691	2%	3,039	24%
Dairy – Skim milk powder	22-Sep	US$/t	3,302	3,274	1%	2,482	33%
Dairy – Cheddar cheese	22-Sep	US$/t	4,274	4,328	-1%	3,857	11%
Dairy – Anhydrous milk fat	22-Sep	US$/t	5,962	5,970	0%	5,061	18%

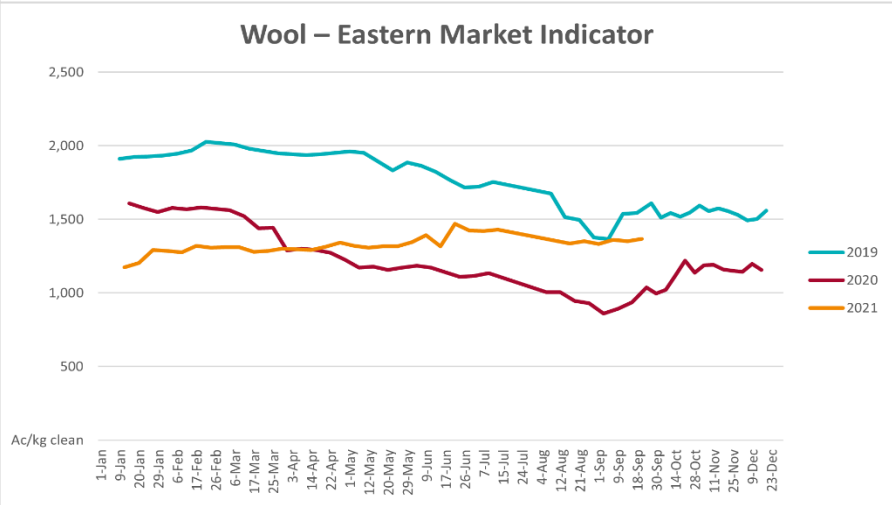
a Global Dairy Trade prices are updated twice monthly on the first and third Tuesday of each month.

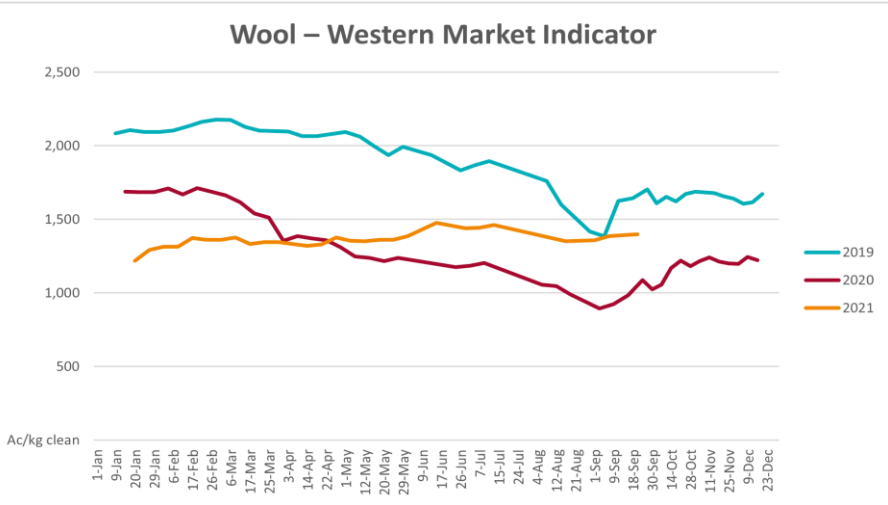
3.1. Selected world indicator prices



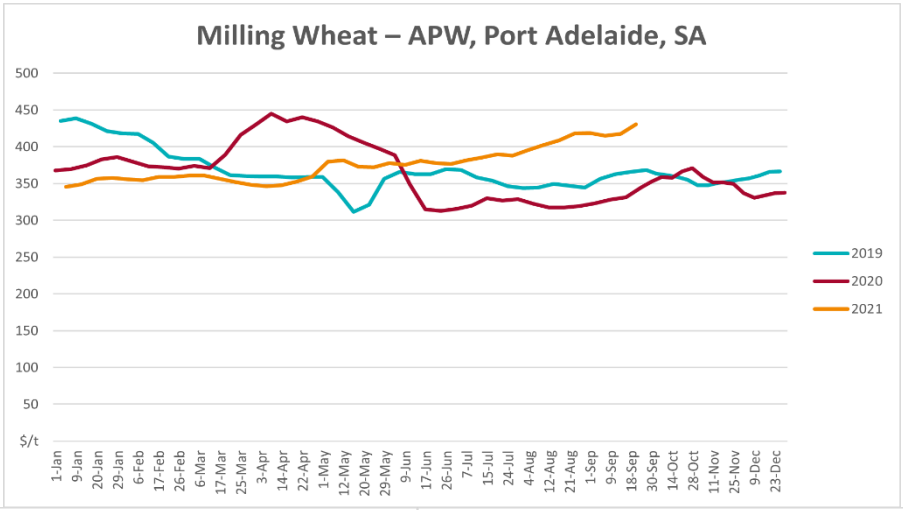

Cotton – Cotlook 'A' Index
120
100
80
60
40
20
USc/lb
2019
2020
2021

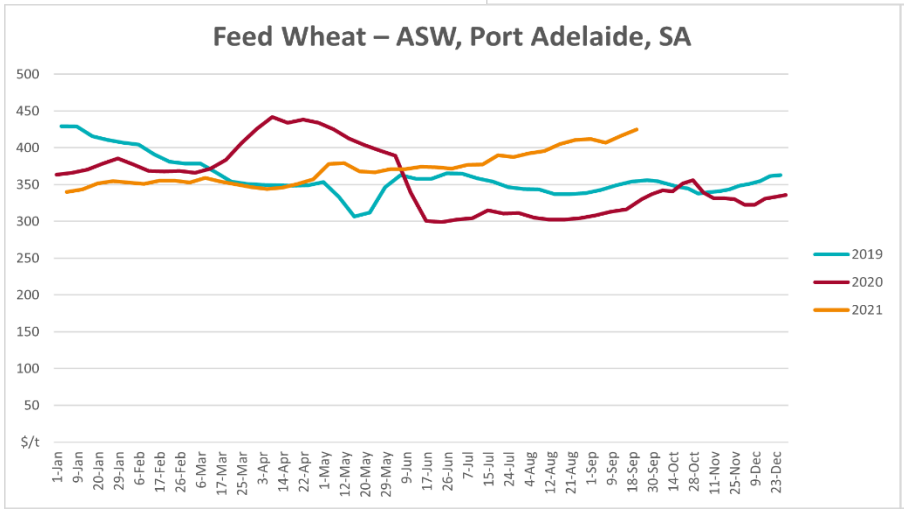

Sugar – Intercontinental Exchange, nearby futures, no.11 contract
25
20
15
10
5
USc/lb
2019
2020
2021

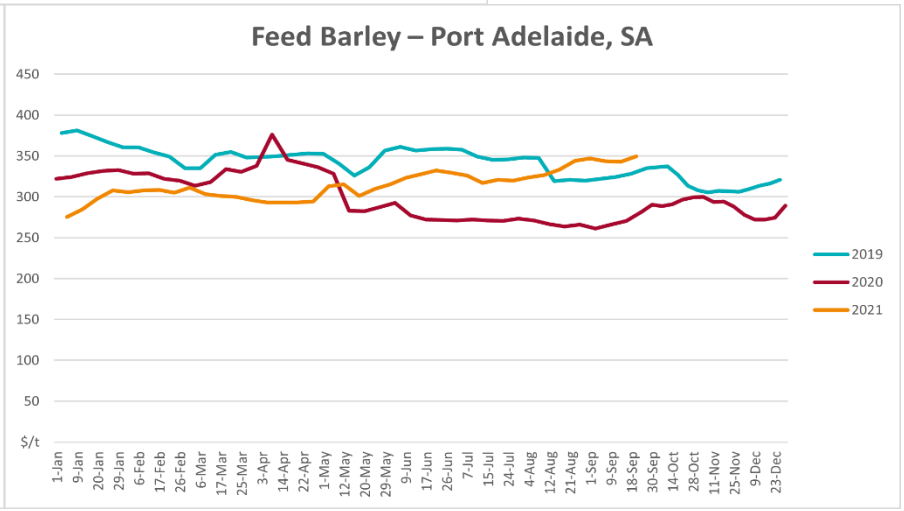

Wool – Eastern Market Indicator
2,500
2,000
1,500
1,000
500
Ac/kg clean
2019
2020
2021

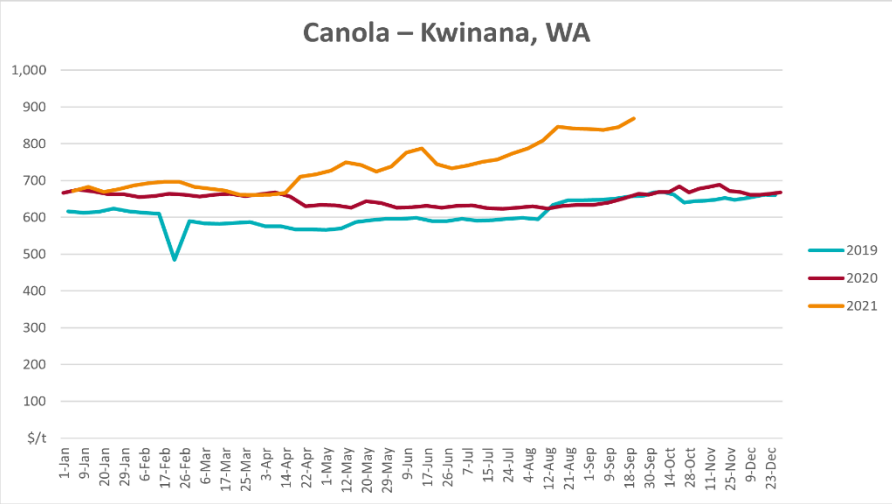

Wool – Western Market Indicator
2,500
2,000
1,500
1,000
500
Ac/kg clean
2019
2020
2021

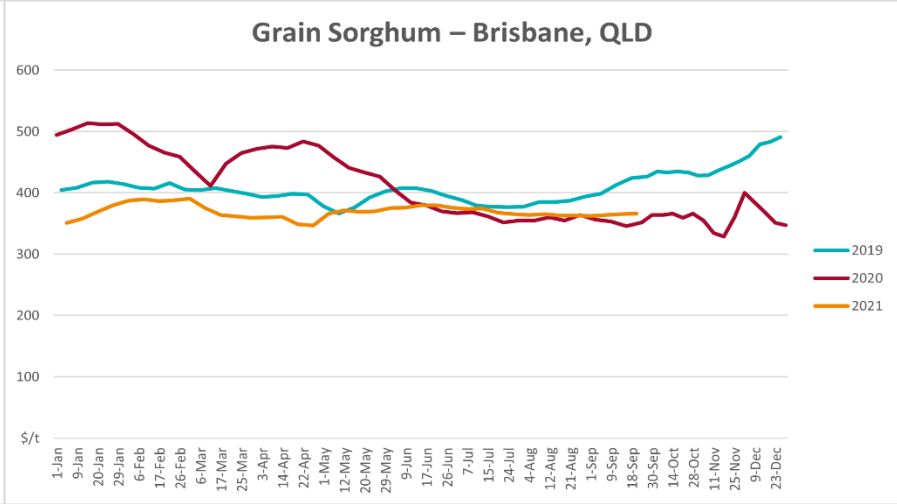
3.2. Selected domestic crop indicator prices



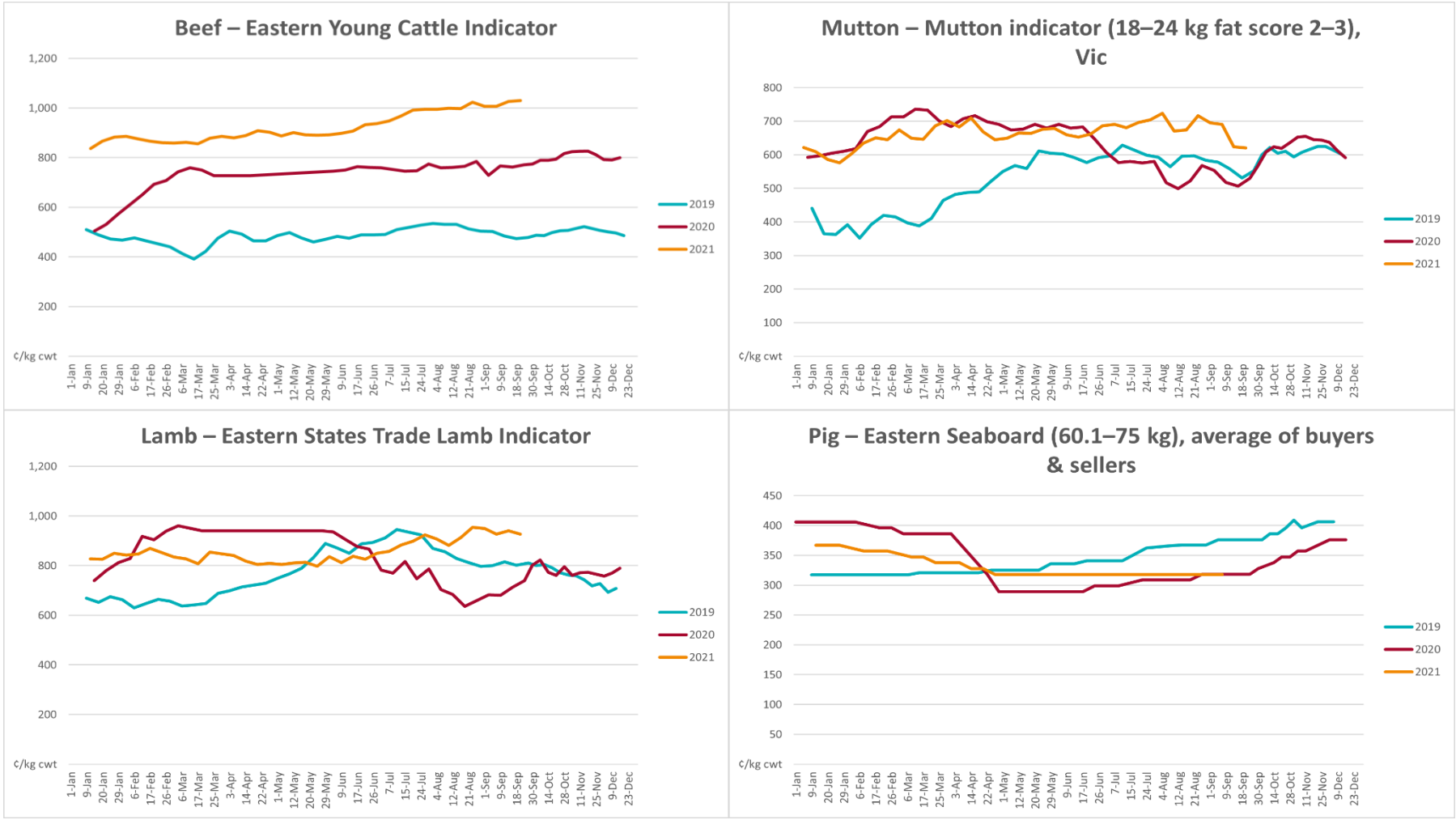


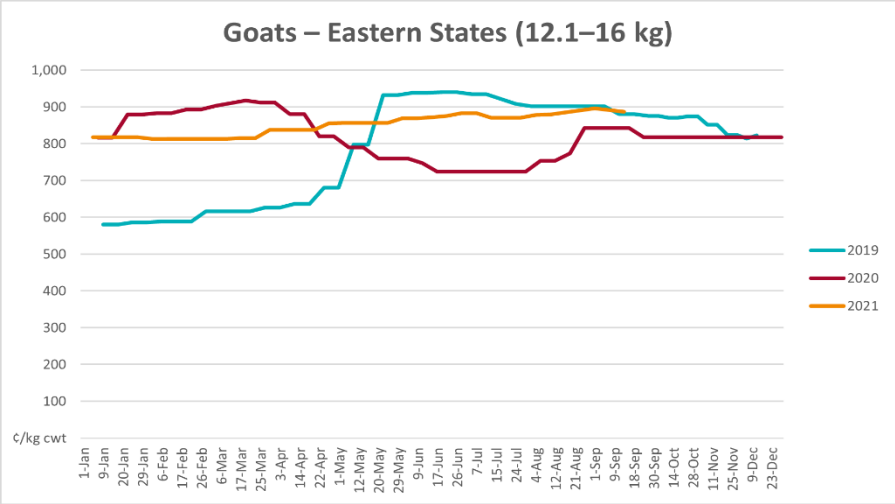


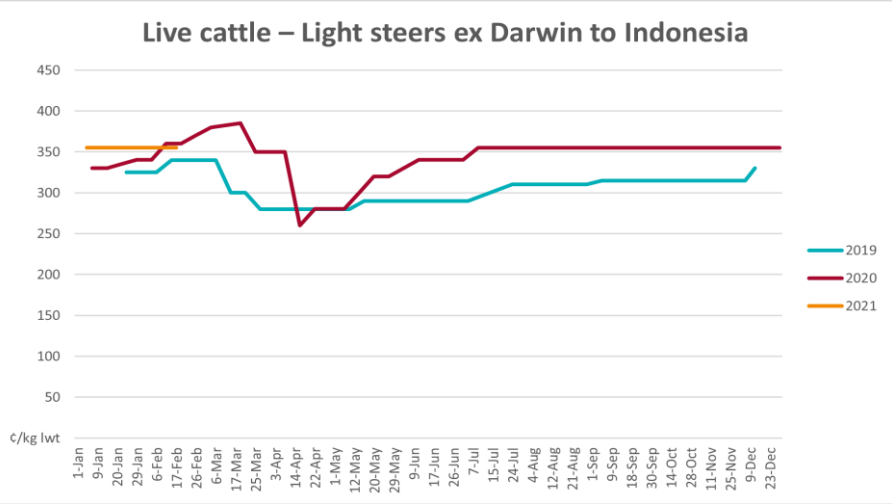

Canola – Kwinana, WA
1,000
900
800
700
600
500
400
300
200
100
$/t
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
17-Feb
26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
9-Jun
17-Jun
26-Jun
7-Jul
15-Jul
24-Jul
4-Aug
12-Aug
21-Aug
1-Sep
9-Sep
18-Sep
30-Sep
14-Oct
28-Oct
11-Nov
25-Nov
9-Dec
23-Dec
2019
2020
2021

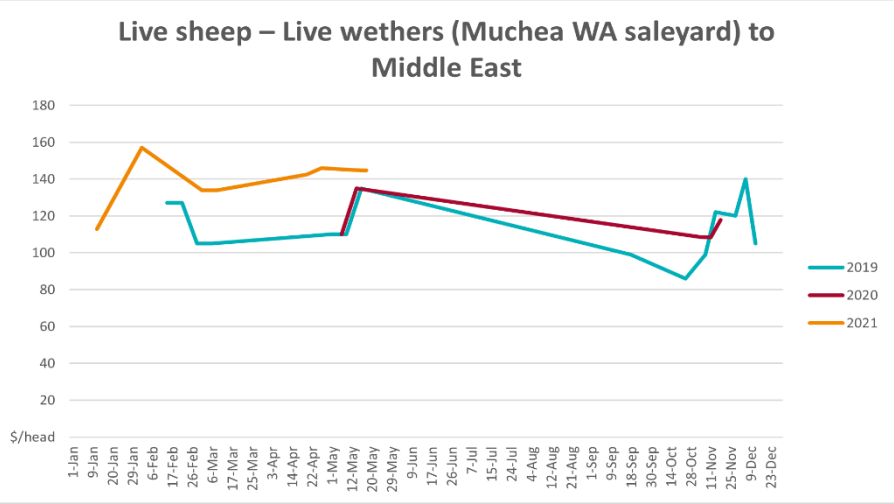

Grain Sorghum – Brisbane, QLD
600
500
400
300
200
100
$/t
1-Jan
9-Jan
20-Jan
29-Jan
6-Feb
17-Feb
26-Feb
6-Mar
17-Mar
25-Mar
3-Apr
14-Apr
22-Apr
1-May
12-May
20-May
29-May
9-Jun
17-Jun
26-Jun
7-Jul
15-Jul
24-Jul
4-Aug
12-Aug
21-Aug
1-Sep
9-Sep
18-Sep
30-Sep
14-Oct
28-Oct
11-Nov
25-Nov
9-Dec
23-Dec
2019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

3.3. Selected domestic livestock indicator prices

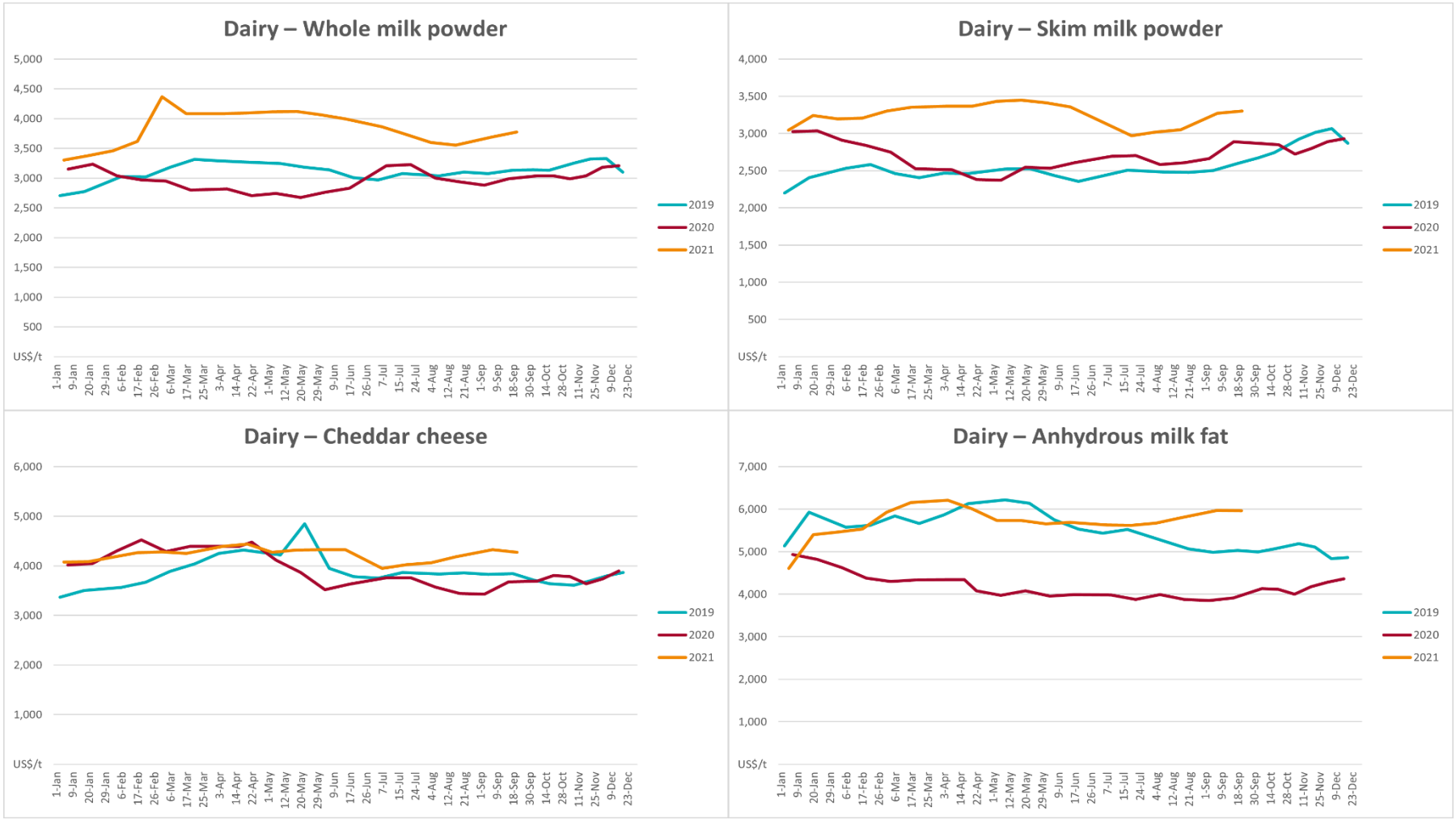



Goats – Eastern States (12.1–16 kg)
1,000
900
800
700
600
500
400
300
200
100
¢/kg cwt
2019
2020
2021

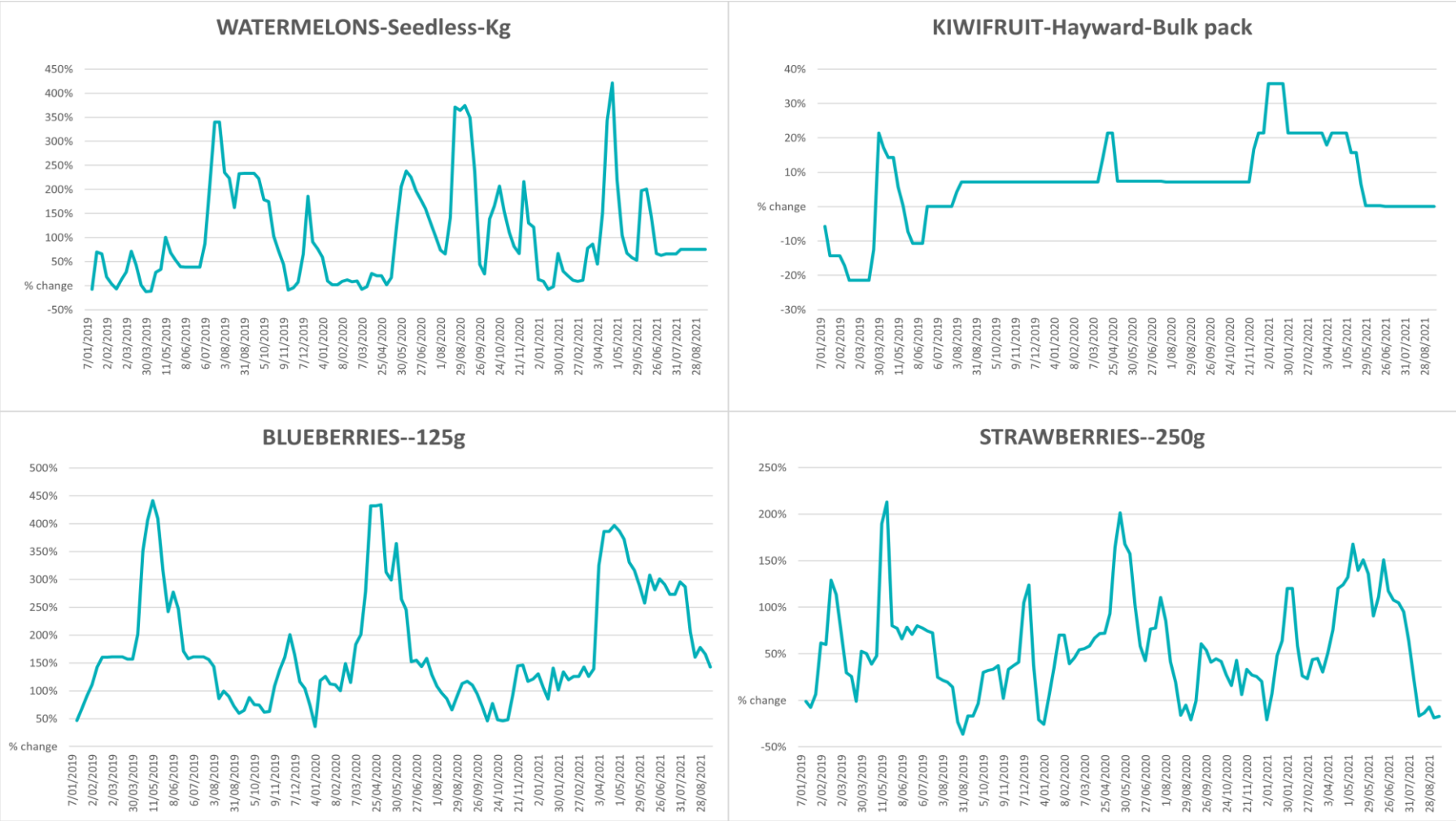

Live cattle – Light steers ex Darwin to Indonesia
450
400
350
300
250
200
150
100
50
¢/kg lwt
2019
2020
2021

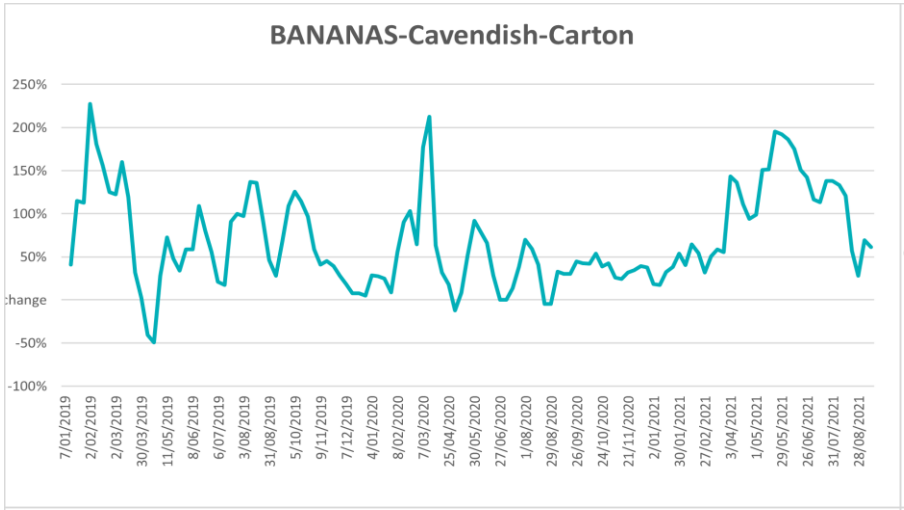

Live sheep – Live wethers (Muchea WA saleyard) to Middle East
180
160
140
120
100
80
60
40
20
$/head
2019
2020
2021

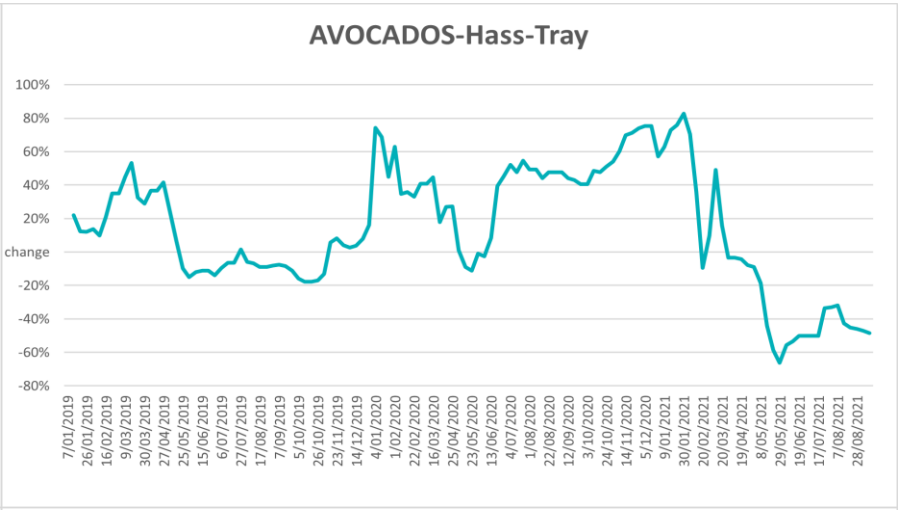
3.4. Global Dairy Trade (GDT) weighted average prices



3.5. Selected fruit and vegetable prices




BANANAS-Cavendish-Carton
250%
200%
150%
100%
50%
change
-50%
-100%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
9/11/2019
7/12/2019
4/01/2020
8/02/2020
7/03/2020
25/04/2020
30/05/2020
27/06/2020
1/08/2020
29/08/2020
26/09/2020
24/10/2020
21/11/2020
2/01/2021
30/01/2021
27/02/2021
3/04/2021
1/05/2021
29/05/2021
26/06/2021
31/07/2021
28/08/2021


AVOCADOS-Hass-Tray
100%
80%
60%
40%
20%
change
-20%
-40%
-60%
-80%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
20/03/2021
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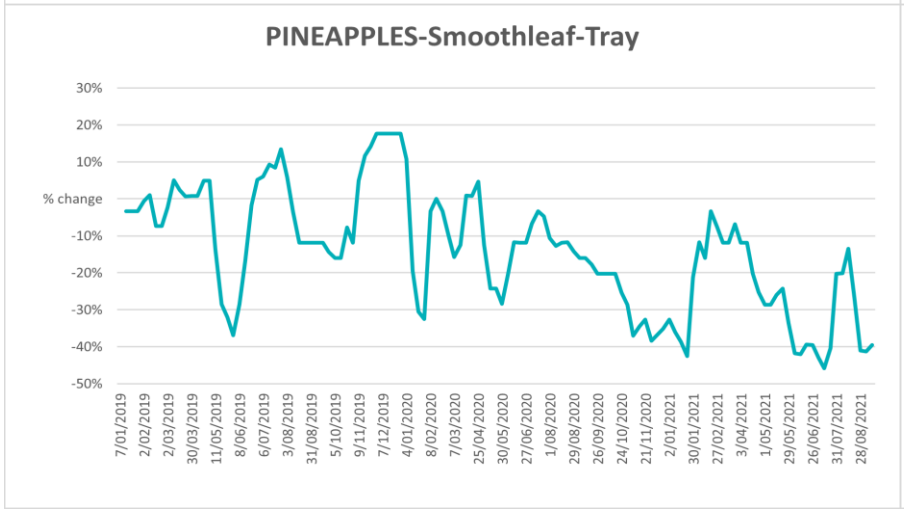
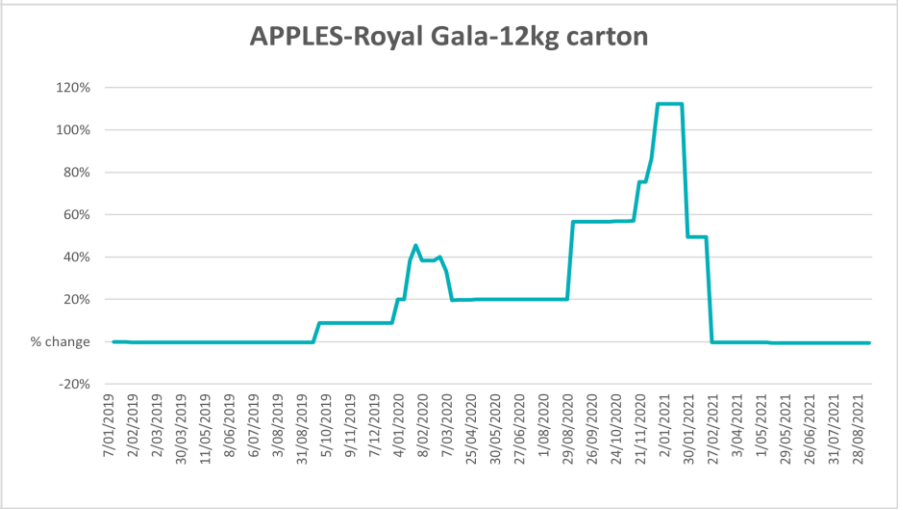
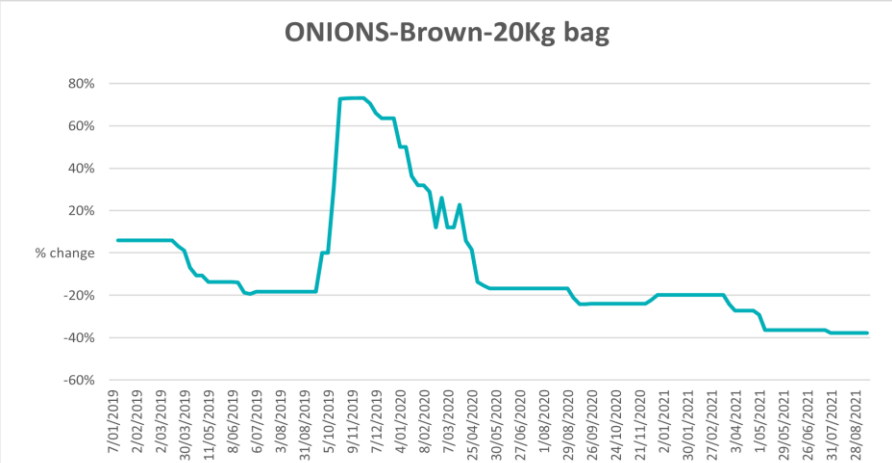
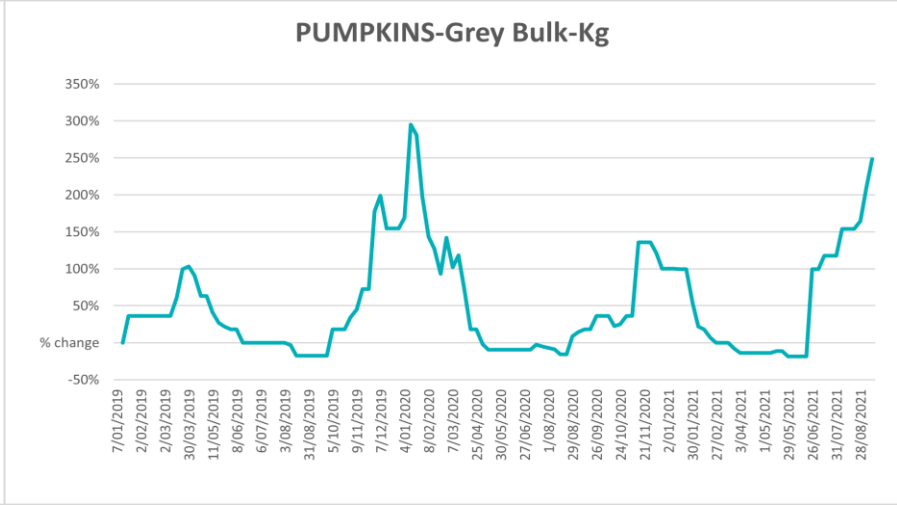
8/05/2021
29/05/2021
19/06/2021
17/07/2021
7/08/2021
28/08/2021


PINEAPPLES-Smoothleaf-Tray
30%
20%
10%
% change
-10%
-20%
-30%
-40%
-50%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
9/11/2019
7/12/2019
4/01/2020
8/02/2020
7/03/2020
25/04/2020
30/05/2020
27/06/2020
1/08/2020
29/08/2020
26/09/2020
24/10/2020
21/11/2020
2/01/2021
30/01/2021
27/02/2021
3/04/2021
1/05/2021
29/05/2021
26/06/2021
31/07/2021
28/08/2021


APPLES-Royal Gala-12kg carton
120%
100%
80%
60%
40%
20%
% change
-20%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
9/11/2019
7/12/2019
4/01/2020
8/02/2020
7/03/2020
25/04/2020
30/05/2020
27/06/2020
1/08/2020
29/08/2020
26/09/2020
24/10/2020
21/11/2020
2/01/2021
30/01/2021
27/02/2021
3/04/2021
1/05/2021
29/05/2021
26/06/2021
31/07/2021
28/08/2021


ONIONS-Brown-20Kg bag
80%
60%
40%
20%
% change
-20%
-40%
-60%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
9/11/2019
7/12/2019
4/01/2020
8/02/2020
7/03/2020
25/04/2020
30/05/2020
27/06/2020
1/08/2020
29/08/2020
26/09/2020
24/10/2020
21/11/2020
2/01/2021
30/01/2021
27/02/2021
3/04/2021
1/05/2021
29/05/2021
26/06/2021
31/07/2021
28/08/2021


PUMPKINS-Grey Bulk-Kg
350%
300%
250%
200%
150%
100%
50%
% change
-50%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
9/11/2019
7/12/2019
4/01/2020
8/02/2020
7/03/2020
25/04/2020
30/05/2020
27/06/2020
1/08/2020
29/08/2020
26/09/2020
24/10/2020
21/11/2020
2/01/2021
30/01/2021
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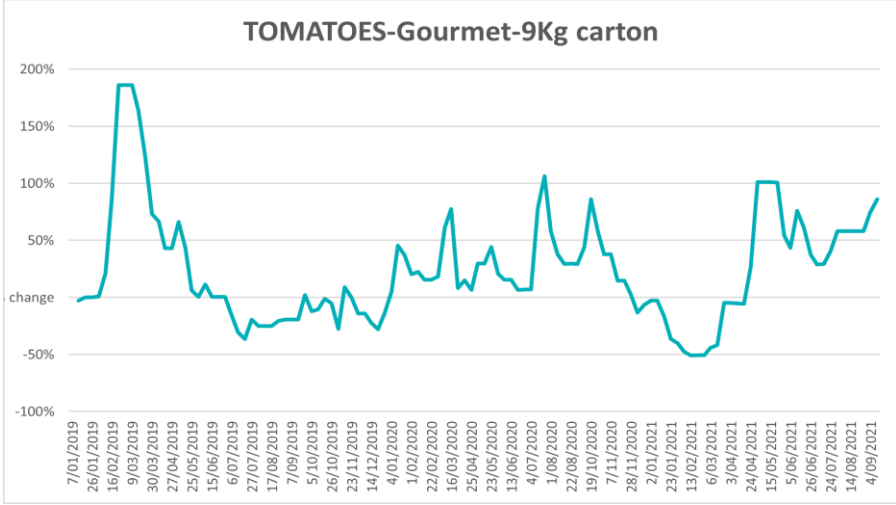
3/04/2021
1/05/2021
29/05/2021
26/06/2021
31/07/2021
28/08/2021


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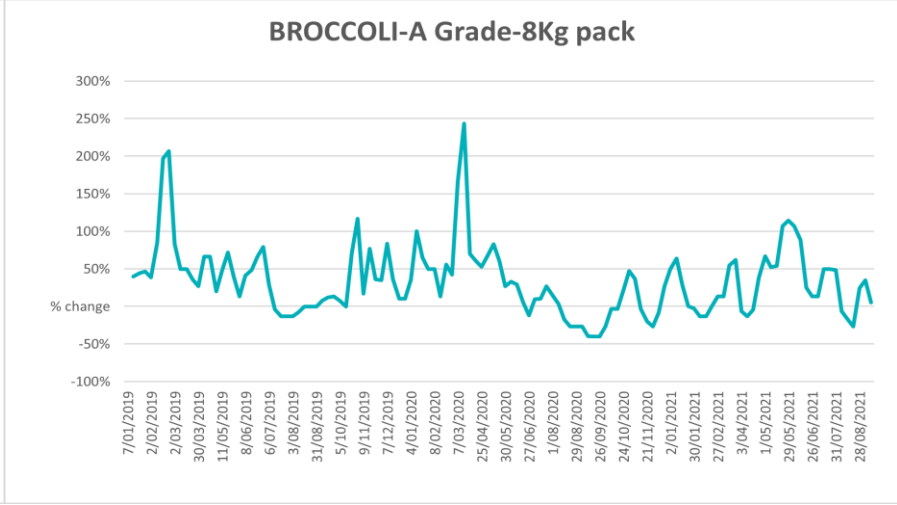
14/08/2021
4/09/2021


BROCCOLI-A Grade-8Kg pack
300%
250%
200%
150%
100%
50%
% change
-50%
-100%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
9/11/2019
7/12/2019
4/01/2020
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1/08/2020
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2/01/2021
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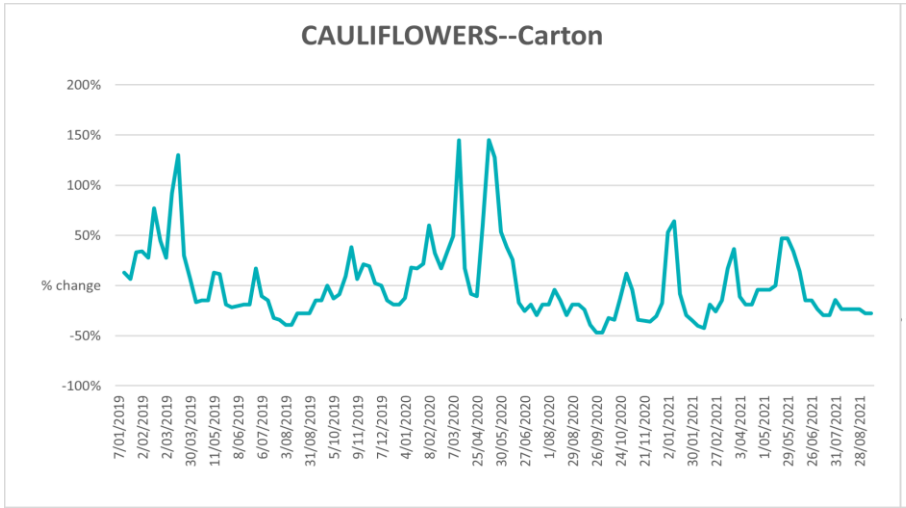
CAULIFLOWERS--Carton
200%
150%
100%
50%
% change
-50%
-100%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
9/11/2019
7/12/2019
4/01/2020
8/02/2020
7/03/2020
25/04/2020
30/05/2020
27/06/2020
1/08/2020
29/08/2020
26/09/2020
24/10/2020
21/11/2020
2/01/2021
30/01/2021
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3/04/2021
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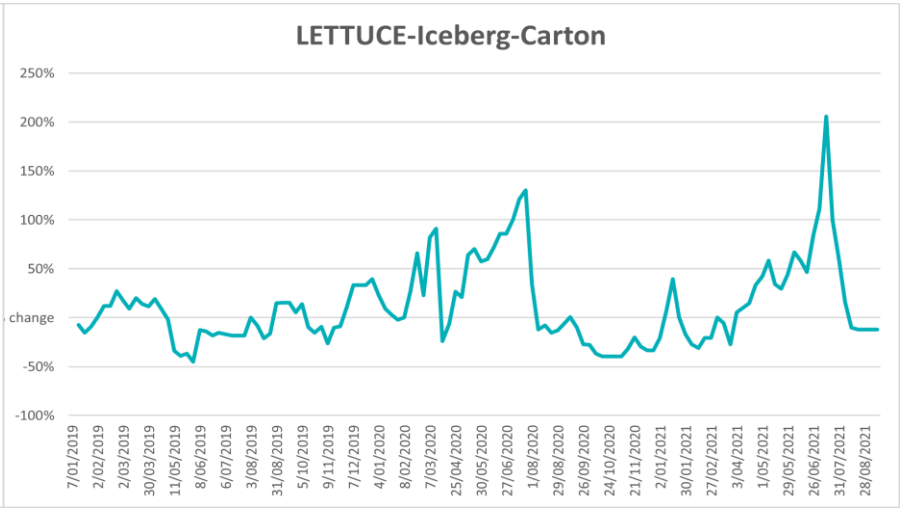
28/08/2021


LETTUCE-Iceberg-Carton
250%
200%
150%
100%
50%
change
-50%
-100%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
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21/11/2020
2/01/2021
30/01/2021
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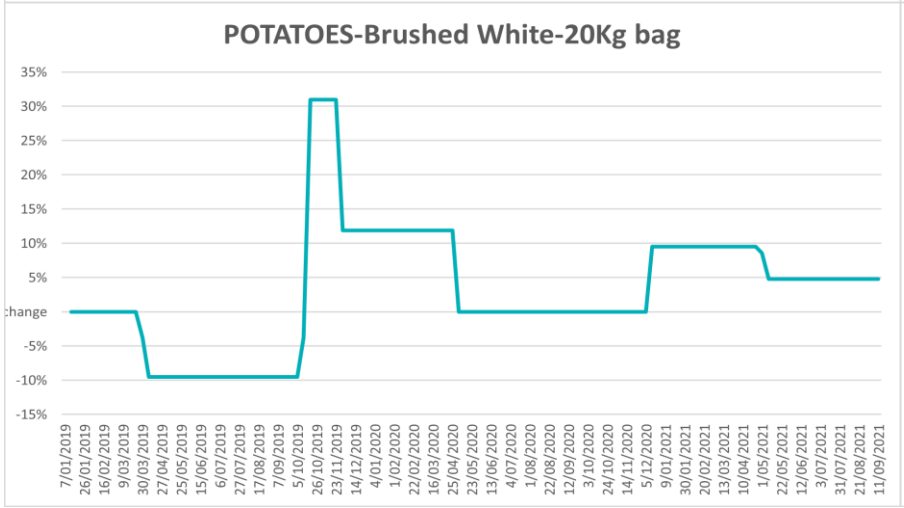
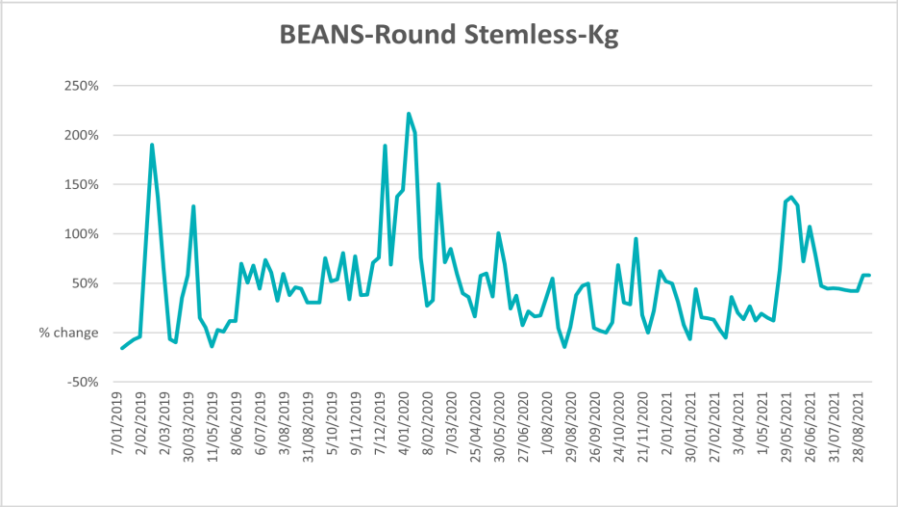
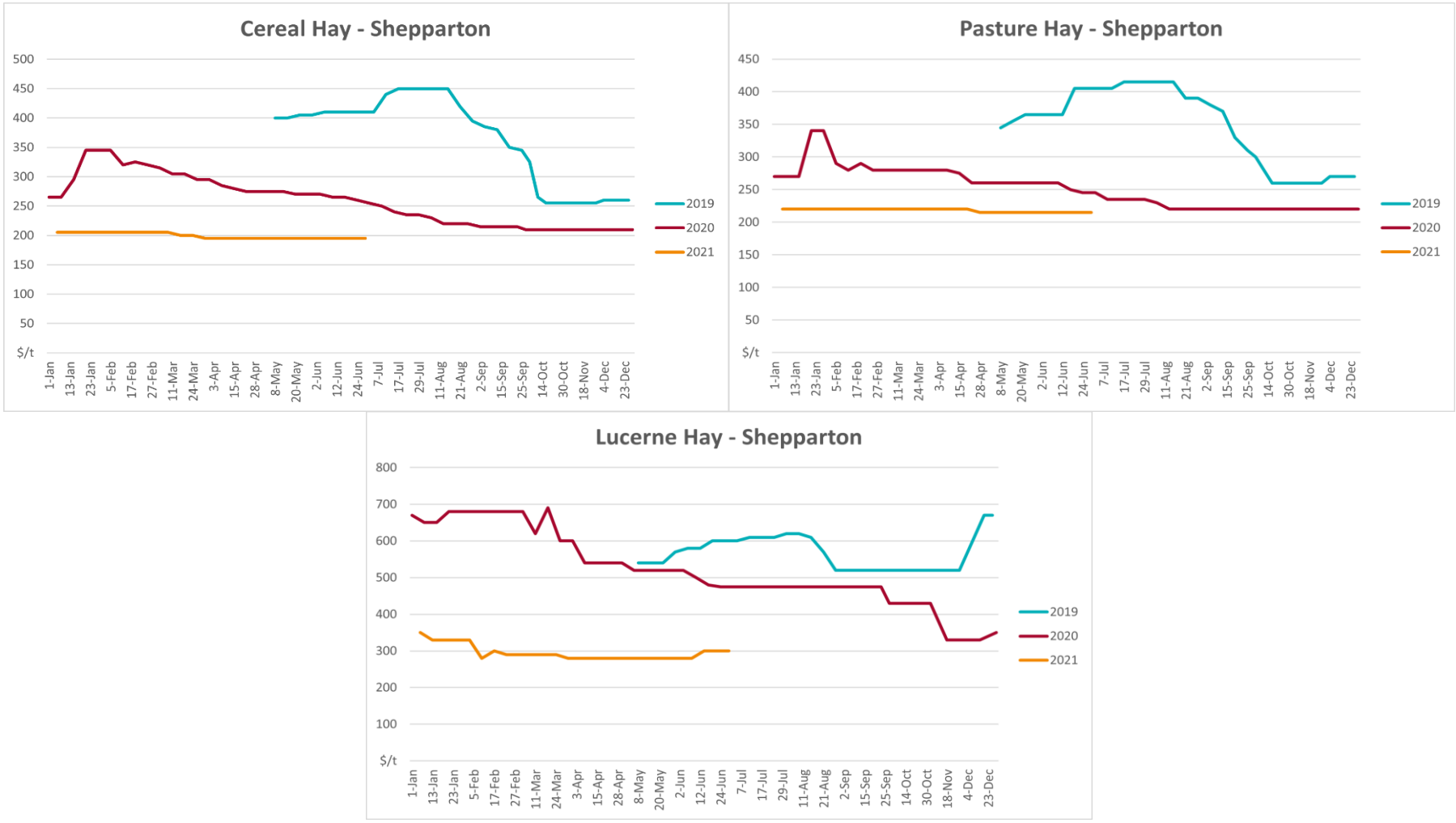
28/08/2021


POTATOES-Brushed White-20Kg bag
35%
30%
25%
20%
15%
10%
5%
change
-5%
-10%
-15%
7/01/2019
26/01/2019
16/02/2019
9/03/2019
30/03/2019
27/04/2019
25/05/2019
15/06/2019
6/07/2019
27/07/2019
17/08/2019
7/09/2019
5/10/2019
26/10/2019
23/11/2019
14/12/2019
4/01/2020
1/02/2020
22/02/2020
16/03/2020
25/04/2020
23/05/2020
13/06/2020
4/07/2020
1/08/2020
22/08/2020
12/09/2020
3/10/2020
24/10/2020
14/11/2020
5/12/2020
9/01/2021
30/01/2021
20/02/2021
13/03/2021
10/04/2021
1/05/2021
22/05/2021
12/06/2021
3/07/2021
31/07/2021
21/08/2021
11/09/2021


BEANS-Round Stemless-Kg
250%
200%
150%
100%
50%
% change
-50%
7/01/2019
2/02/2019
2/03/2019
30/03/2019
11/05/2019
8/06/2019
6/07/2019
3/08/2019
31/08/2019
5/10/2019
9/11/2019
7/12/2019
4/01/2020
8/02/2020
7/03/2020
25/04/2020
30/05/2020
27/06/2020
1/08/2020
29/08/2020
26/09/2020
24/10/2020
21/11/2020
2/01/2021
30/01/2021
27/02/2021
3/04/2021
1/05/2021
29/05/2021
26/06/2021
31/07/2021
28/08/2021

3.6. Selected domestic fodder indicator prices



4. Data attribution

Climate

Bureau of Meteorology

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

Other

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

Water

Prices

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

Bureau of Meteorology:

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

Trade constraints:

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

Commodities

Fruit and vegetables

- Datafresh: www.freshstate.com.au

Pigs

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

Dairy

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

World wheat, canola

- International Grains Council

World coarse grains

- United States Department of Agriculture

World cotton

- Cotlook: www.cotlook.com/

World sugar

- New York Stock Exchange - Intercontinental Exchange

Wool

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

Domestic wheat, barley, sorghum, canola and fodder

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

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

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

Cataloguing data
This publication (and any material sourced from it) should be attributed as:

ABARES 2021, Weekly Australian Climate, Water and Agricultural Update, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, 23 September 2021. CC BY 4.0 DOI: https://doi.org/10.25814/5f3e04e7d2503

ISSN 2652-7561

This publication is available at https://www.agriculture.gov.au/abares/products/weekly_update

Department of Agriculture, Water and the Environment

GPO Box 858 Canberra ACT 2601

Telephone 1800 900 090

Web awe.gov.au/abares

Acknowledgements
This report was prepared by Cameron Van-Lane and Matthew Miller.