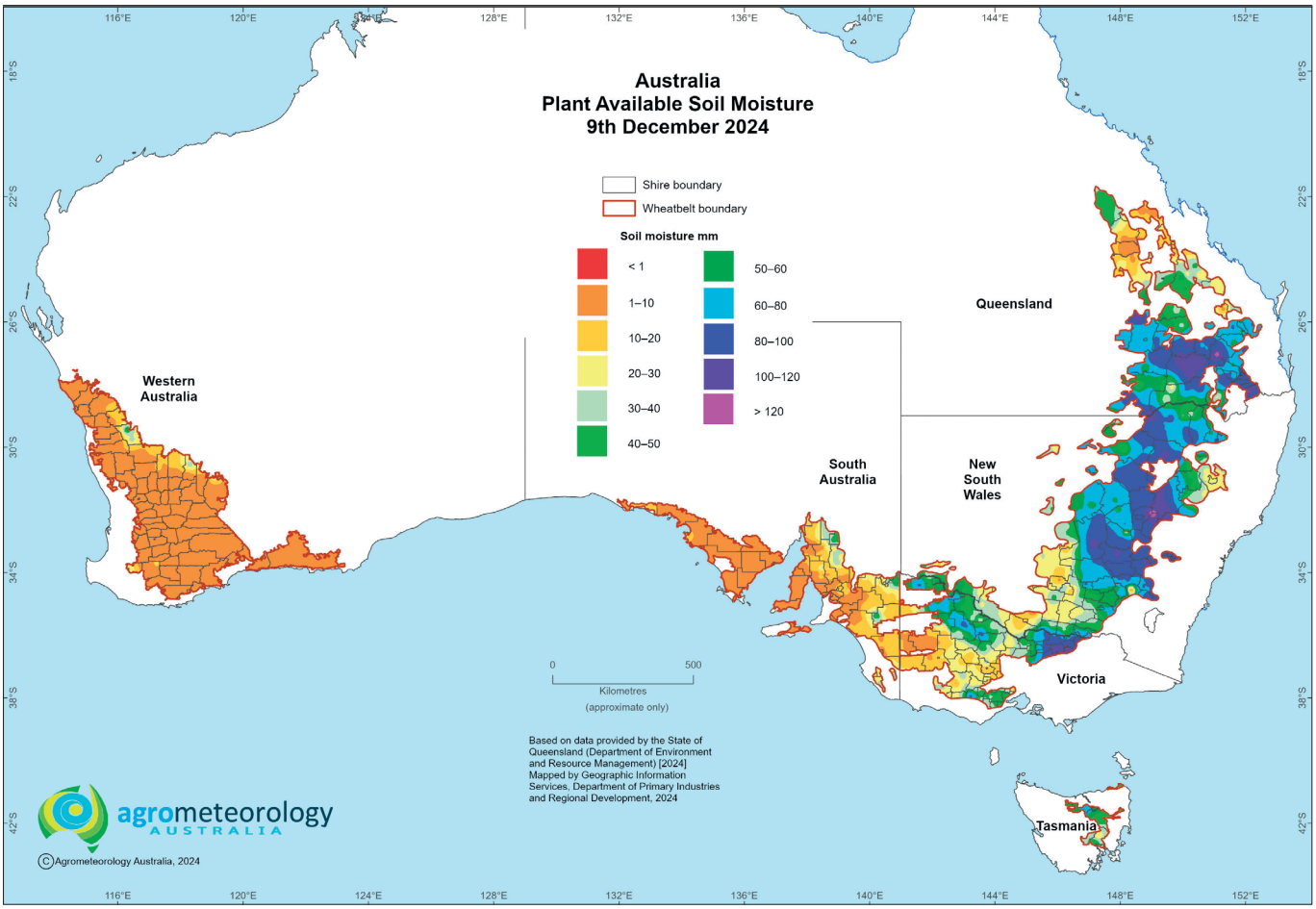


Rainfall turns around for many in the start of summer

Kondinin Group has engaged Dr David Stephens from Agrometeorology Australia to produce these soil moisture ranking maps (based on data starting from October 2023). By **Kondinin Group**

The maps show shire names and are produced as close to real-time after rainfall is recorded at more than 1000 real-time rain measurement stations across the country. This month, the weather section also includes a new long-lead index that should better assist climate risk assessments in the Australian grain belt.

Readers are reminded that the latest images can also be found online at www.farmingahead.com.au

STATUS: 12 DECEMBER, 2024

Rainfall in much of south-eastern Australia turned around as the summer season began. Above average rainfall occurred throughout New South Wales and in the far north-west and north-east of Victoria. Many shires in these regions have already received their full quota of summer season rain. There is however, a strip along the coast from the Eyre Peninsula to south-west Victoria where patches of below average rainfall have persisted. South-east Queensland has had an average start to summer rains and average moisture levels are present.

In Western Australia, the far northern wheatbelt had a number of falls around 15mm in October and November, but much of this has evaporated. Some heavier falls along the edge of the wheatbelt near Perenjori and Mukinbudin have the model indicating moisture stored at depth. South-eastern cropping areas have had a dry harvest and below average rains have been recorded along the south coast from Albany to Esperance.

Climate indicators remain positive for summer rainfall. A very weak La Nina type pattern is in place, with winds and pressure along the equator more distinctive than ocean temperatures. The Indian Ocean Dipole (IOD) is weakly negative while warm water off the Pilbara should assist cyclone development of the West Australian coast. Warm water off the New South Wales coast should also assist rainfall in this state.

NEW LONG-LEAD INDEX

Australia has the highest crop yield variability in the world amongst major grain producing countries. Major droughts and wet periods make agricultural decision making a difficult task. Farmers must plan early in the year about crop size and inputs.

As seeding develops, farmers adjust decisions as climate indicators and soil moisture conditions emerge.

A west start to summer has hindered some crop harvesting. Photo: Mark Saunders

Traditional factors, like the Southern Oscillation index (SOI) and IOD do not normally indicate an extreme year until the predictability barrier in May-June has passed.

Earlier crop seeding in recent years means that crops are mostly planted by this time. So, one of the greatest needs for Australian agriculture are indicators that better indicate climate extremes with lead-time.

In 2024, an "anomalous drought" developed over south-eastern Australia in a favourable post-El Nino scenario. Some climate models did pick a bit of a dry winter in this region, but nearly all were indicating a wet spring.

Crop model yields from Agrometeorology Australia's (Agromet's) STIN model were below average across south-eastern Australia (see *Farming Ahead* December 2024, No 395) . In parts of the central north of South Australia, yields were ranked in the lowest five per cent of years in 100.

Whilst analysing this, Dr Stephens made one the biggest discoveries of his 40-year scientific career. He noticed that certain environmental variables related to rain formation start evolving into a dry pattern early in the year.

This led to a new "lead-index", which goes hand-in-hand with a "now-time index" that goes extreme as rainfall anomalies appear (see Figure 1 for south-eastern Australia).

In Figure 1, The time series of climate indices can be seen to vary together with de-trended wheat yields (green triangles).

Importantly, the new lead-index better indicated the "unexplained droughts" in south-eastern Australia in 2018 and 2024, the lack of recovery out of dry conditions in early 2019, and the better run of years between 2020-2022.

Economic studies show farmers' overall viability is based on capitalising on better seasons. Both indices should be used together to give an appropriate level of "climate risk" in decision making. From early July, decisions related to fertiliser application and other inputs can be enhanced.

In south-west Western Australia, a different suite of indicators is needed as this region is more influenced by the Circumpolar Vortex over Antarctica.

In this case, a more favourable outlook was in place in the first four months of 2018 (Figure 2). Some volatility in indices occurred mid-year, but the now-time index rebounded in July and WA grew 57 per cent of the national wheat crop.

Once again, poor years are better indicated early in 2019 and 2023, whilst better seasons are indicted between 2020-2022.

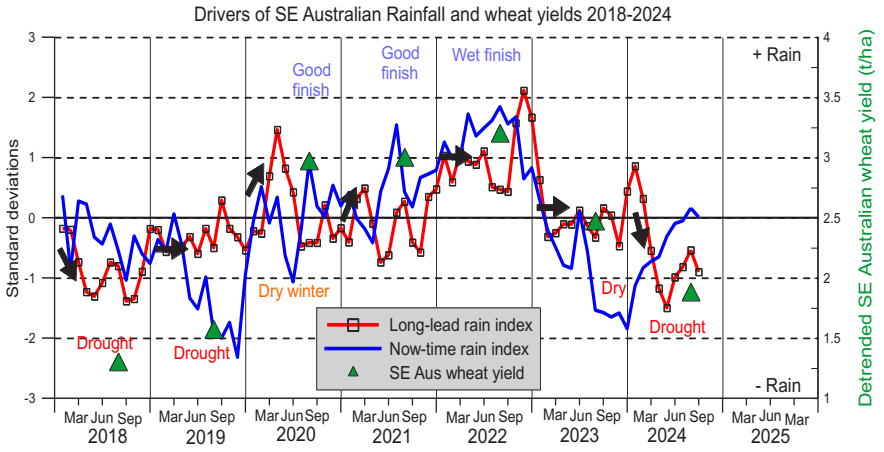
A very dry start occurred early in 2024 as now-time indicators stayed negative, but the long-lead index suggested a turnaround, which occurred between late June to August.

Preliminary analysis indicates that a long-lead index for the north-eastern cropping zone (north of central New South Wales) would also have had a more favourable outlook than the south-east in 2024.

For more information and a subscription to a monthly delivery of indices see www.agromet.com.au, or email david.stephens@agromet.com.au

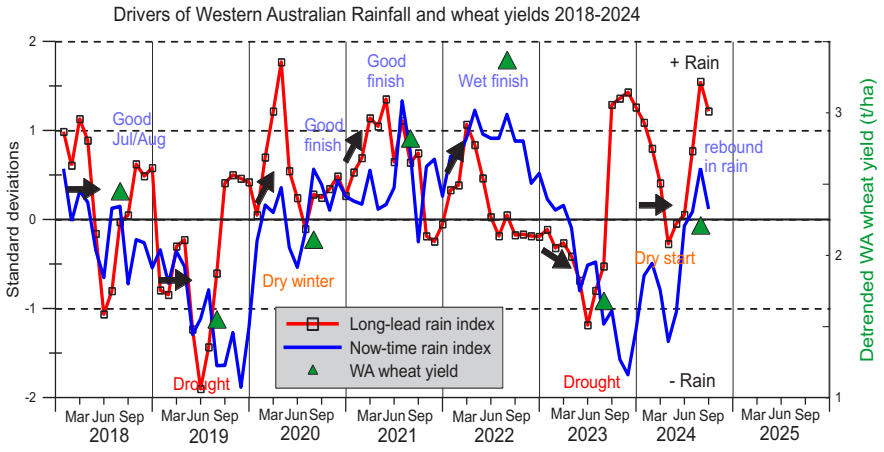
FA

Figure 1.



A time series of Agromet's monthly now-time and long-lead indices for south-eastern Australia, January 2018-September 2024. De-trended average wheat yields for this region shown in green triangles (right y-axis).

Figure 2.



A time-series of Agromet's monthly now-time and long-lead indices for south-west WA from January 2018-September 2024. De-trended average wheat yields for this region shown in green triangles (right y-axis).