

Seasonal Climate Outlook

Date: September 2024

Key points to consider:

- **Temperature outlook:** The Bureau of Meteorology's Australian Community Climate Earth-System Simulator-Seasonal (ACCESS-S) forecasts near-normal maximum temperatures for spring (September to November), with a 40-70% chance of exceeding median temperatures, and a 70% chance for the Esperance region. Forecast skill ranges from 65% to 100%.

The minimum temperature outlook indicates warmer-than-normal night-time temperatures, with a 70-80% chance of exceeding the median, and a forecast skill of 55-75%. However, frost remains likely in low-lying areas.

- **El Niño Southern Oscillation (ENSO):** ENSO is currently neutral, with 3 out of 7 climate models suggesting a La Niña might develop from November. It's important to note that ENSO events have minimal influence on the South West Land Division beyond the winter-spring period.
- **Indian Ocean Dipole (IOD):** The IOD is currently neutral, with most models predicting it will remain so until November. The IOD is typically inactive between November and May.
- **Southern Annular Mode (SAM):** SAM was strongly negative in August, which increased the number of cold fronts reaching the SWLD. It is now neutral and is expected to remain so until the end of September. However, SAM's predictability beyond two weeks is generally low.

Overall, the outlook for spring suggests average rainfall with mild temperatures, indicating a likely "soft finish" compared to last year's hot and dry conditions.

Rainfall outlook for the South West Land Division

A summary of 19 national and international models shows that, for the South West Land Division (SWLD) from September to November 2024, 8 models suggest a neutral chance of exceeding median rainfall, 4 indicate below-median rainfall, and 7 suggest above-median rainfall.

It's important to understand that a neutral outlook does not imply average rainfall but rather reflects normal climatic conditions, where a range of outcomes is possible.

Looking further ahead, most models predict a neutral chance of exceeding median rainfall through to summer, from December 2024 to February 2025. However, it is important to note that forecast accuracy decreases significantly with such a long lead time.

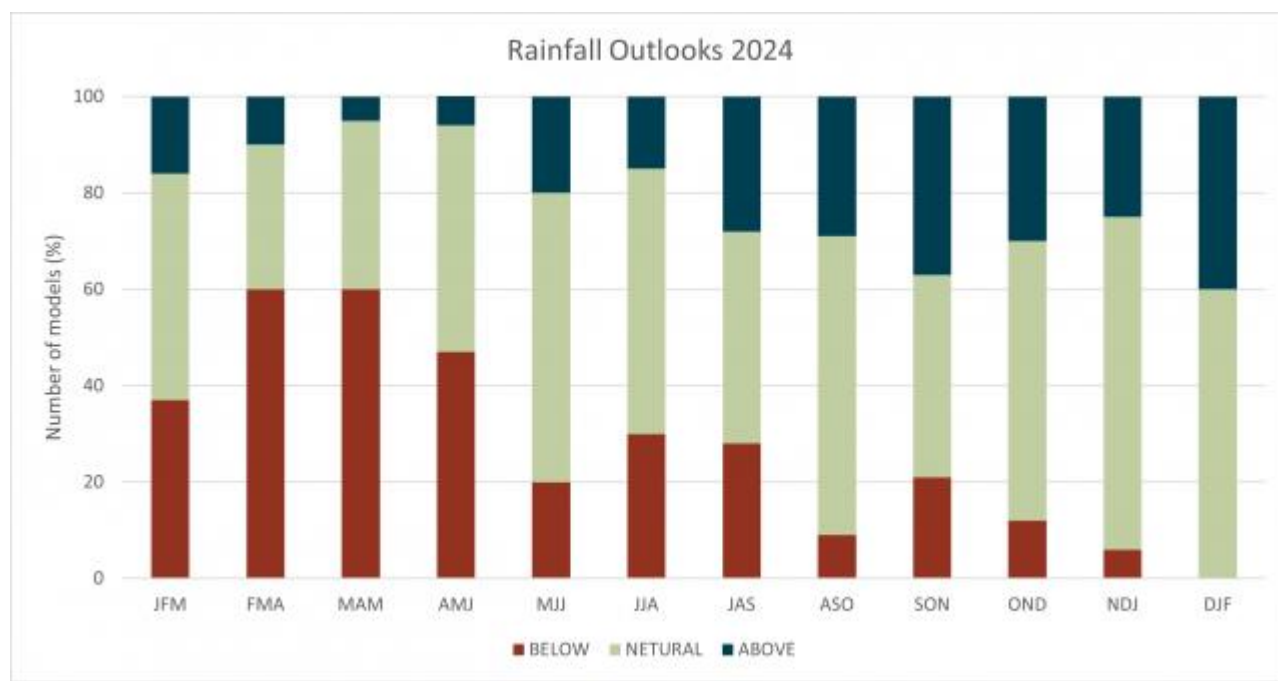


Fig 1. Model summary of rainfall outlook for the South West Land Division up to November 2024 to January 2025, with majority of models indicating a neutral chance of exceeding median rainfall.

Frost forecast

The Bureau of Meteorology (BOM) has discontinued the production of frost potential forecast maps, like the one shown in Figure 2, due to the obsolescence of the underlying technology, which is no longer supported. As a result, these products have been retired. For frost-related information, users can now refer to the following BOM products and services:

- **MetEye:** Offers a more detailed frost forecast with a longer lead time for every location in Australia. It allows users to see the likelihood of frost or heavy frost in three-hourly intervals for the next 7 days.
- **BOM Weather App:** Provides hourly forecasts for temperature, wind, and rain for the next 72 hours, with frost indicated by a weather icon for each hour.

Frost Potential

Frost potential for: PM 06/08/2024 - AM 07/08/2024

[About frost potential maps](#)

Frost Potential is produced from computer models. As it contains no input from weather forecasters, it is important to also check the Bureau's local forecasts and warnings.

Frost Map

Frost Table

Controls

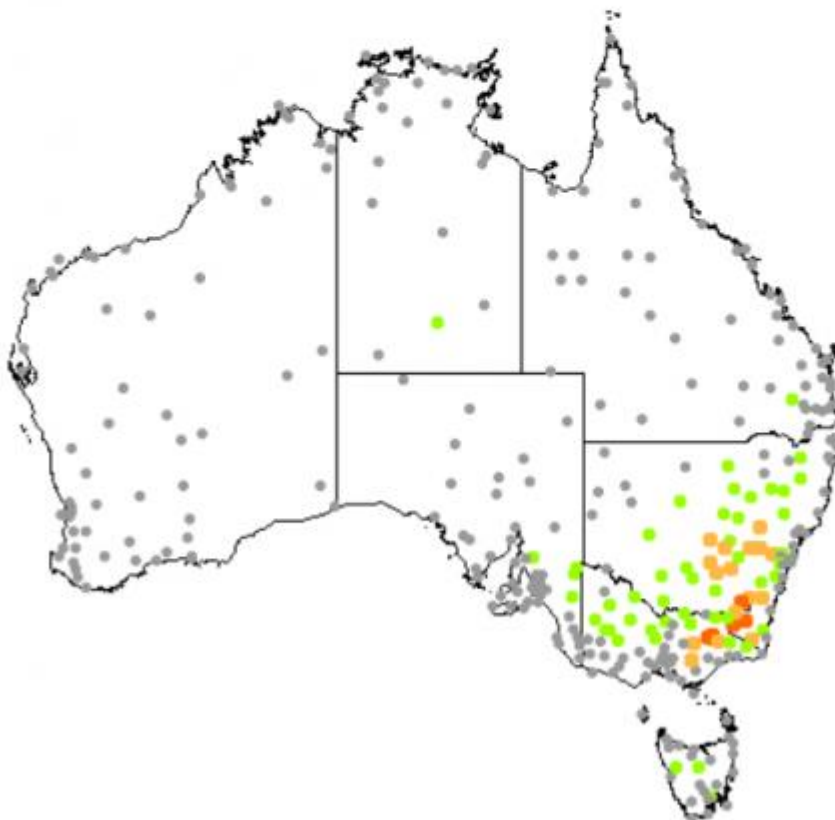
Date

Tuesday night and Wednesday morning

LEADING DAY
LATER

Location

Australia



Frost Potential

- Less than -5°C
- -5°C to -2°C
- -2°C to $+1^{\circ}\text{C}$
- $+1^{\circ}\text{C}$ to $+4^{\circ}\text{C}$
- More than $+4^{\circ}\text{C}$

Figure2. Frost potential map produced from the Bureau of Meteorology for 6-7 August 2024. These maps are no longer produced, see MetEye for frost forecast.

Frost occurrence maps

Average frost occurrence maps can give you an idea of the risk of frost on your farm. Frost occurrence map for 1-26 August 2024 compared to the average map for 1975-2023 indicates that for the majority of the SWLD, the number of nights below 2°C is lower

than average, and August has been warmer than normal. Lake King has had 10 nights below 2°C for this August.

Average frost occurrence map for September, 1975-2023, has lower nights below 2°C than the average map for August. Wandering has the most nights below 2°C, with 6 nights on average.

The frost occurrence and severity maps are created using data from 332 Bureau of Meteorology and 175 DPIRD stations. Both sets of weather stations measure air temperature in a shaded enclosure (usually a Stevenson Screen) at a height of approximately 1.2 m above the ground. So, maps are showing the occurrence of nights below 2°C, as temperature of 2°C at 1.2 m is equivalent to 0°C on the ground, which is cold enough to significantly damage cereal crops.

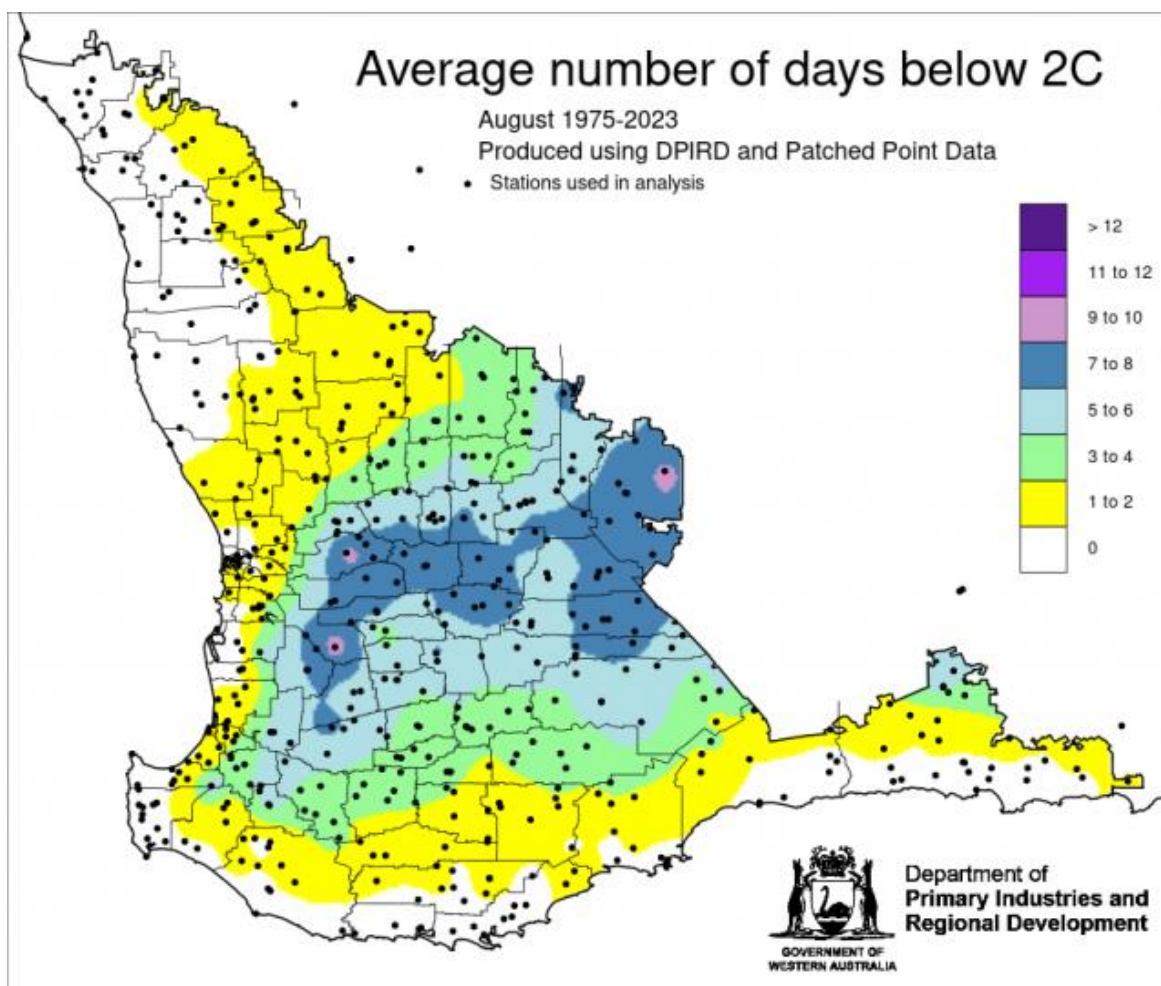


Fig 3. Average number of days below 2°C for August 1975-2023 for the South West Land Division. Southern Cross has the most number of days with frost potential, with average 9 nights.

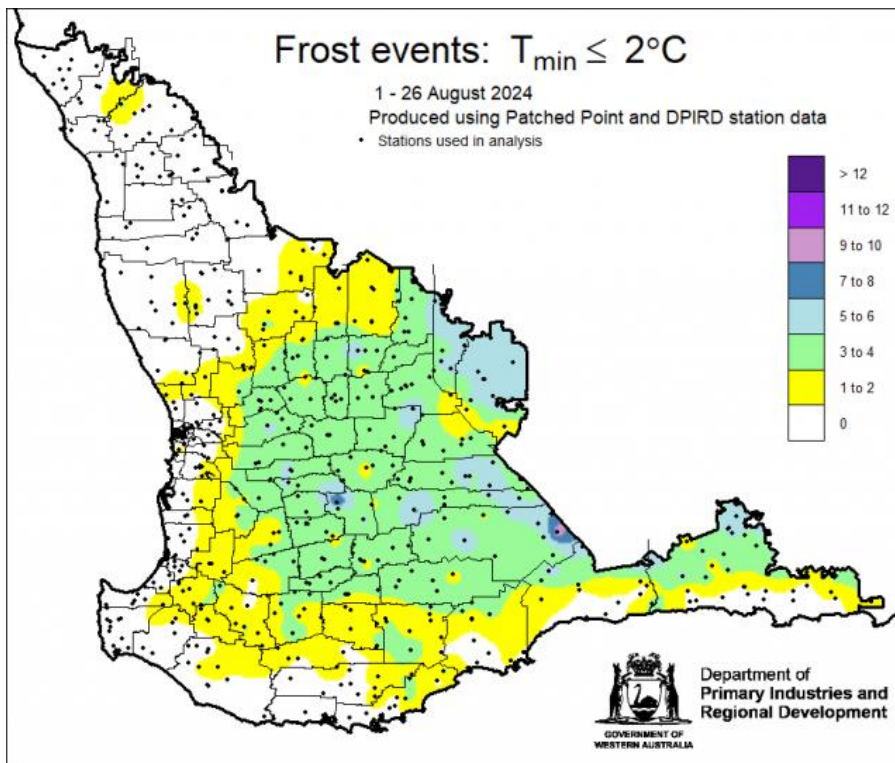


Fig 4. Number of days below 2°C for 1-26 August 2024 for the South West Land Division. Lake King had the most number of days with frost potential, with 10 nights below 2°C , elsewhere it has been a warmer than usual August.

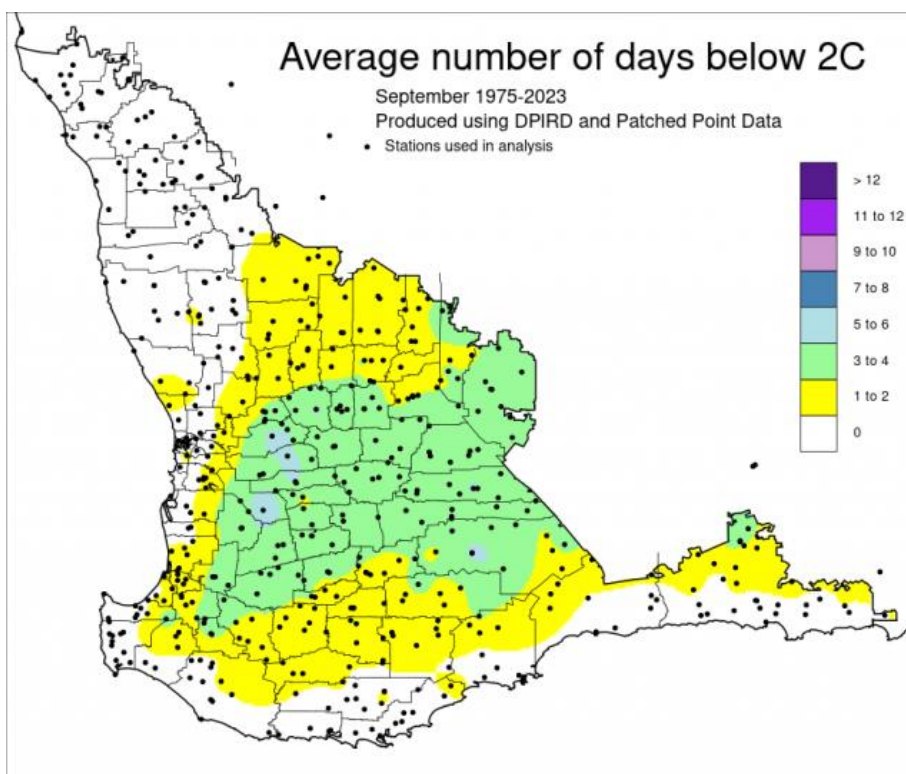


Fig 5. Average number of days below 2°C for September 1975-2023 for the South West Land Division. Wandering has the most number of days with frost potential, with average 9 nights.

Recent climate

The highest rainfall total since 1 April in the South West Land Division is Northcliffe in the shire of Manjimup with 914 mm, the lowest is 126 mm in Nungarin. After high rainfall amounts in August, there are only 12 locations with decile 1 rainfall.

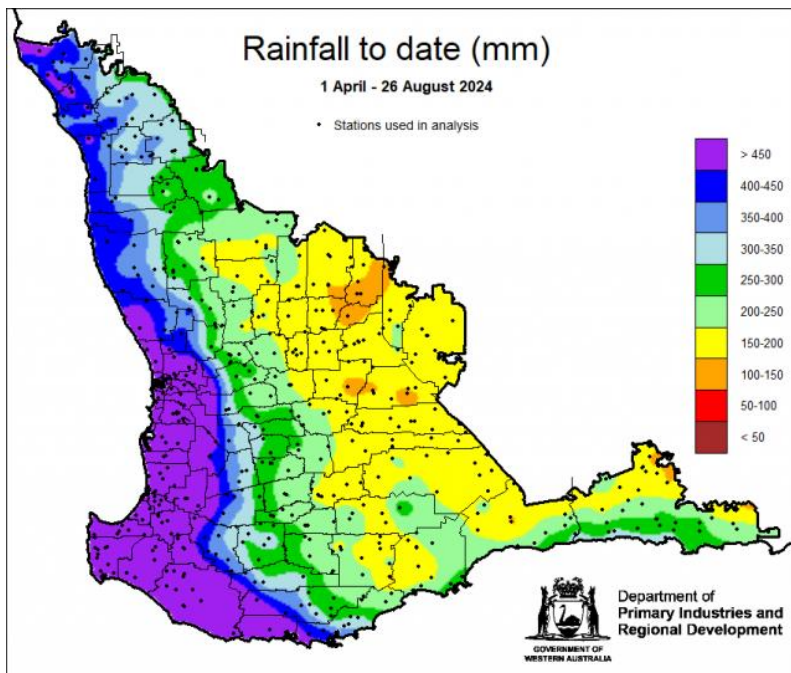


Fig 6. Rainfall map for 1 April to 26 August 2024 for the South West Land Division. Indicating all locations now have received over 100 mm of rain.

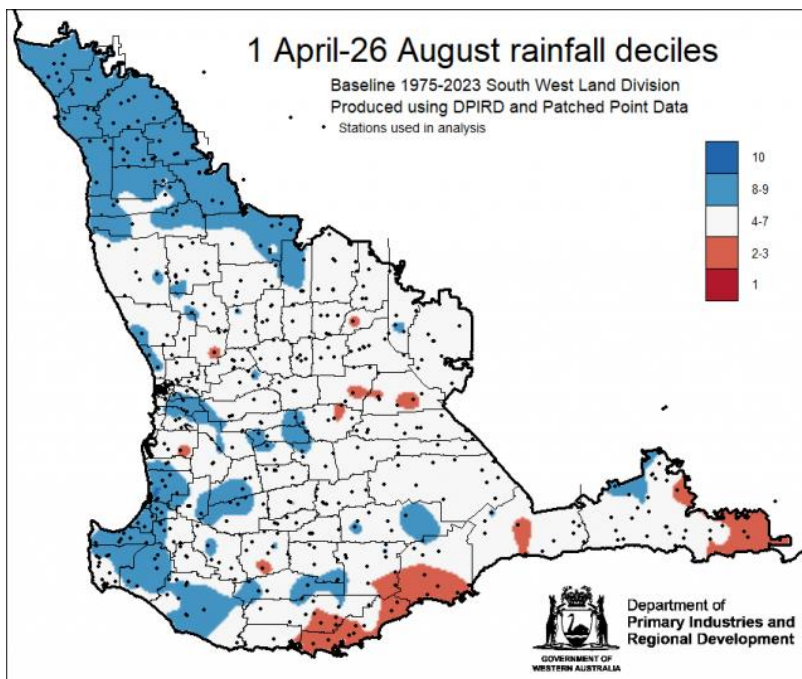


Fig 7. Rainfall decile map for 1 April to 26 August 2024 for the South West Land Division. Indicating decile 1-3 rainfall for Albany and surrounds, eastern Esperance, decile 8-10 for northern wheatbelt and area around Myalup, north of Bunbury, decile 4-7 elsewhere.

The potential yield maps use seasonal rainfall and decile finishes, calculated from historical data, to determine the maximum possible wheat yield under ideal conditions, without any other constraints. These maps serve as a valuable tool in the seasonal decision-making process.

Potential wheat yield is estimated using the French & Schultz potential yield model, which is expressed as:

$$\text{Yield (tonnes/ha)} = \text{WUE} * (\text{stored soil water} + \text{growing season rainfall} - \text{evaporation})$$

Where WUE stands for water use efficiency, and growing season rainfall is typically measured from April to October. The stored soil water at the start of the growing season is estimated as one-third of the summer rainfall.

The maps generated utilise rainfall data from 1 April to 26 August and assume a decile 5 rainfall from 29 August to 31 October, considering three different WUE values—12, 15, and 20 kg/ha/mm.

The lowest yield potential, with a WUE of 12, is 0.8 t/ha at Mukinbudin and Nungarin, while the highest is 7.9 t/ha at Rocky Gully.

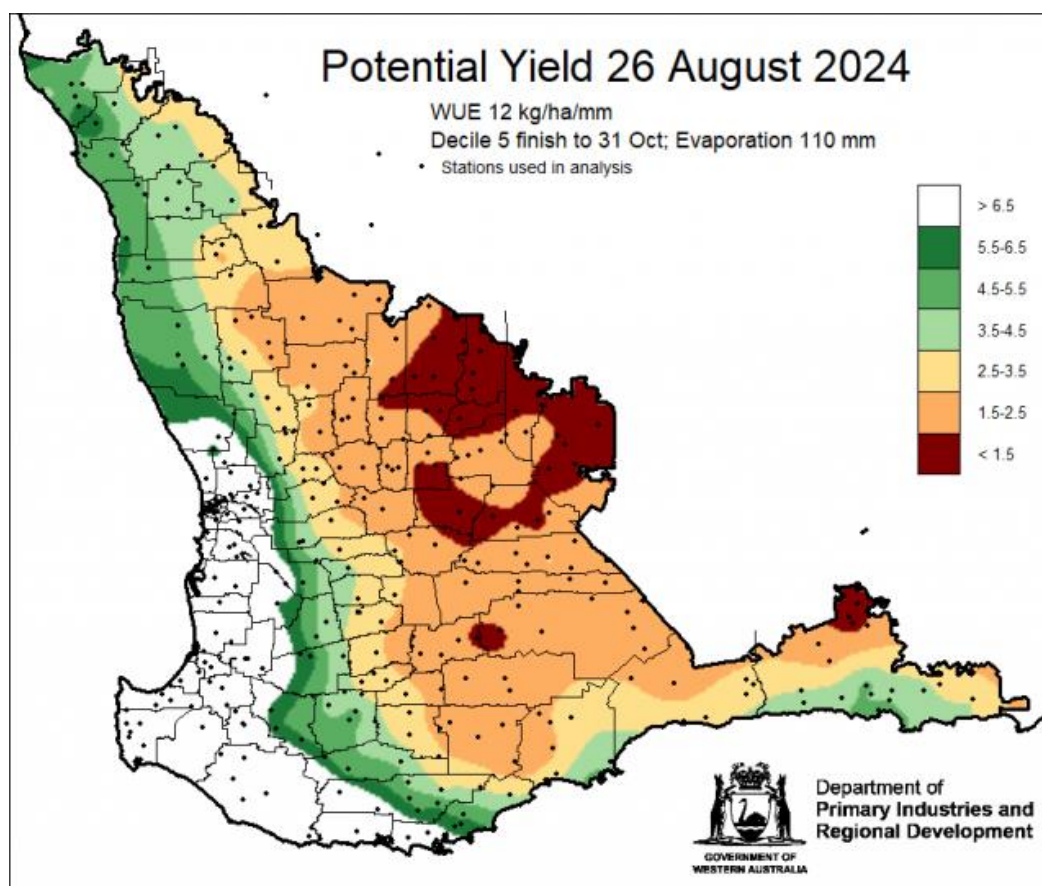


Fig 8. French and Schultz modelled potential yield map for 26 August for the South West Land Division. Using water use efficiency of 12 kg/ha/mm, decile 5 finish and evaporation rate of 110 mm. Showing some parts of the South West Land Division have lower than 1.5 t/ha potential yield.

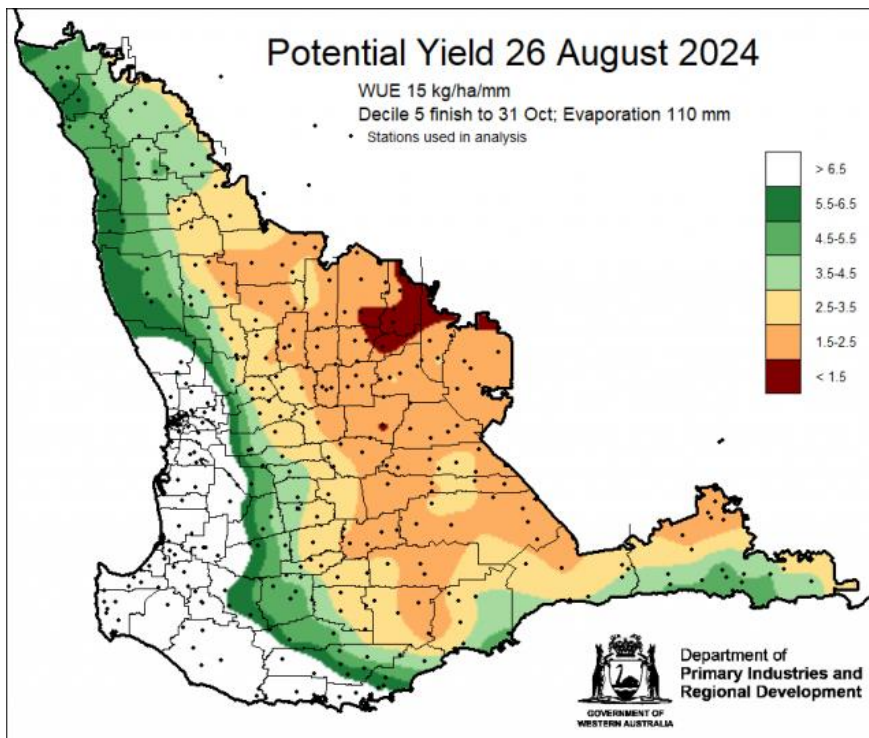


Fig 9. French and Schultz modelled potential yield map for 26 August for the South West Land Division. Using water use efficiency of 15 kg/ha/mm, decile 5 finish and evaporation rate of 110 mm. Showing some parts of the South West Land Division have lower than 1.5 t/ha potential yield.

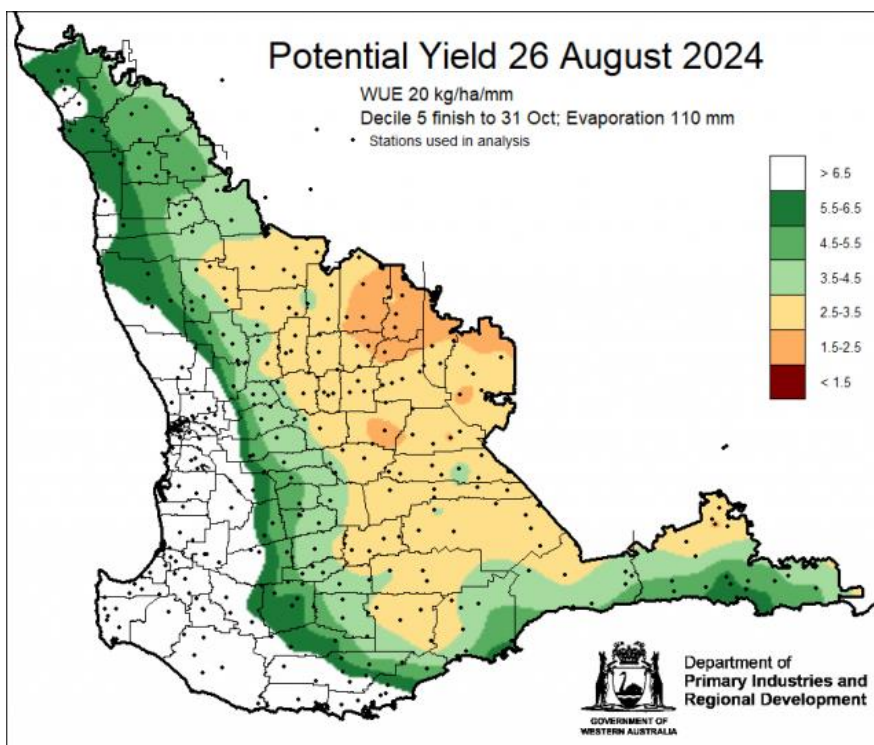


Fig 10. French and Schultz modelled potential yield map for 26 August for the South West Land Division. Using water use efficiency of 20 kg/ha/mm, decile 5 finish and evaporation rate of 110 mm. Showing all locations have greater than 1.5 t/ha potential yield.

The latest DPIRD plant available soil water map is using the Food and Agriculture Organization of the United Nations (FAO) crop factor method. This method assumes that post-germination, there are four stages of crop growth.

On any day during the crop lifecycle, the crop coefficient for the crop's growth stage is multiplied by the potential evaporation to give an estimate of plant evapotranspiration. Coefficients have been selected to suit WA wheat cropping.

The mean of ten different soil types is mapped, indicating that there is low soil water storage for the majority of the South West Land Division, with higher amounts (above 80 mm) along the west coast, south-west corner and the northern grainbelt.

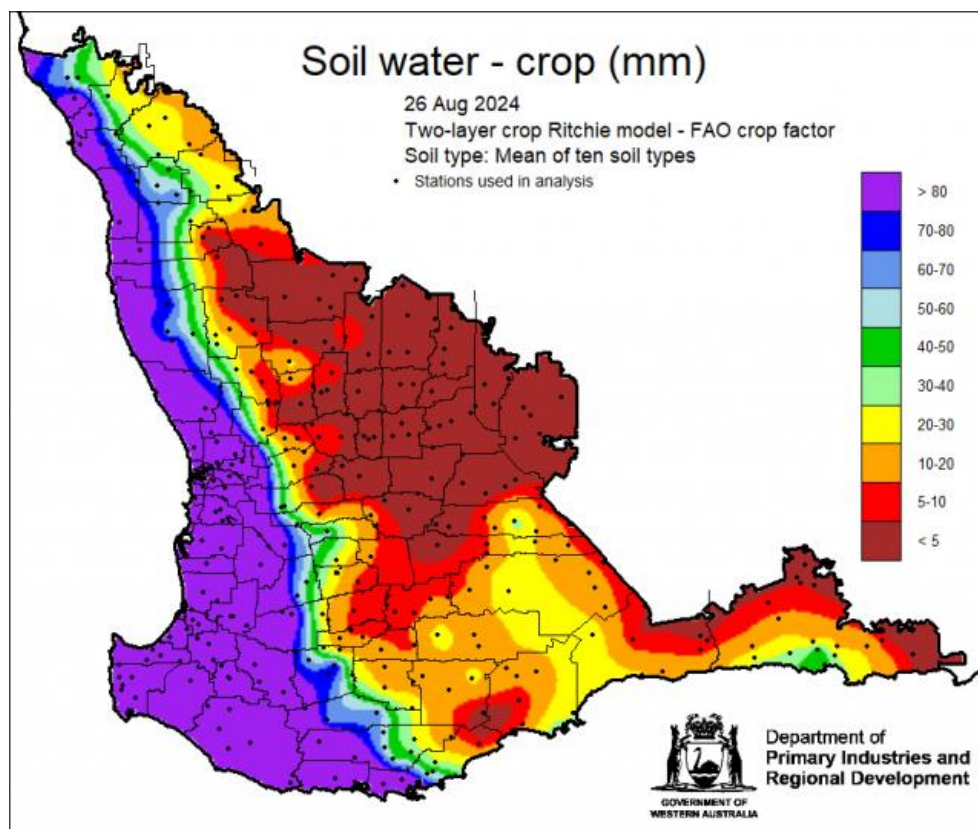


Fig 11. Plant available soil water map using the two-layer Ritchie soil water model FAO crop factor up to 26 August 2024. Indicating that a large part of the South West Land Division has low soil water.

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