Seasonal Climate Outlook

Date: November 2024

Summary

The current rainfall outlook for the South West Land Division (SWLD) from November 2024 to January 2025 shows mixed results: half of the climate models indicate neutral chances of exceeding median rainfall, while the other half suggest above median rainfall. Warmer maximum and minimum temperatures are expected over this period.

The current rainfall outlook for the South West Land Division (SWLD) from November 2024 to January 2025 shows mixed results: half of the climate models indicate neutral chances of exceeding median rainfall, while the other half suggest above median rainfall. Warmer maximum and minimum temperatures are expected over this period.

Key points to consider:

- **Temperature Outlook:** The Bureau of Meteorology's Australian Community Climate Earth-System Simulator-Seasonal (ACCESS-S) forecasts a 70-80% chance of exceeding maximum median temperatures for November 2024 to January 2025, with forecast skill ranging from 75%-100%. For minimum temperatures, there is an 80% chance of exceeding the median, with a forecast skill of 65-100%.
- **El Niño Southern Oscillation (ENSO):** ENSO is currently neutral, with 5 out of 7 climate models projecting neutral conditions through to February 2025.
- **Indian Ocean Dipole (IOD):** The IOD is also neutral, with all 5 models predicting neutral conditions until March 2025. The IOD remains usually remains inactive from November to May during the Australian monsoon season.
- **Southern Annular Mode (SAM):** SAM is also currently neutral and is forecast to remain neutral until the end of November. SAM has no impact on the SWLD during summer.
- **Rainfall outlook Skill:** Rainfall outlooks have low skill during summer in the SWLD due to the influence of localized thunderstorms and tropical cyclones, which are difficult to capture in long term climate models.

Rainfall outlook for the South West Land Division

A summary of 18 national and international models shows that, for the SWLD from November 2024 to January 2025, 9 models suggest a neutral chance of exceeding median rainfall, and the remaining 9 models predict above-median rainfall. It's important to understand that a neutral outlook does not imply average rainfall; rather, it suggests a range of potential outcomes reflecting typical climatic variability.

An above median outlook does not necessarily indicate substantial rainfall, as this period typically sees low precipitation. However, localized thunderstorms can occasionally bring heavy rain to small areas.

Looking further ahead to February-April 2025, 3 out of 6 models indicate neutral chances of exceeding median rainfall, while the other 3 models indicate above-median rainfall. However, forecast accuracy decreases significantly with this longer lead time.

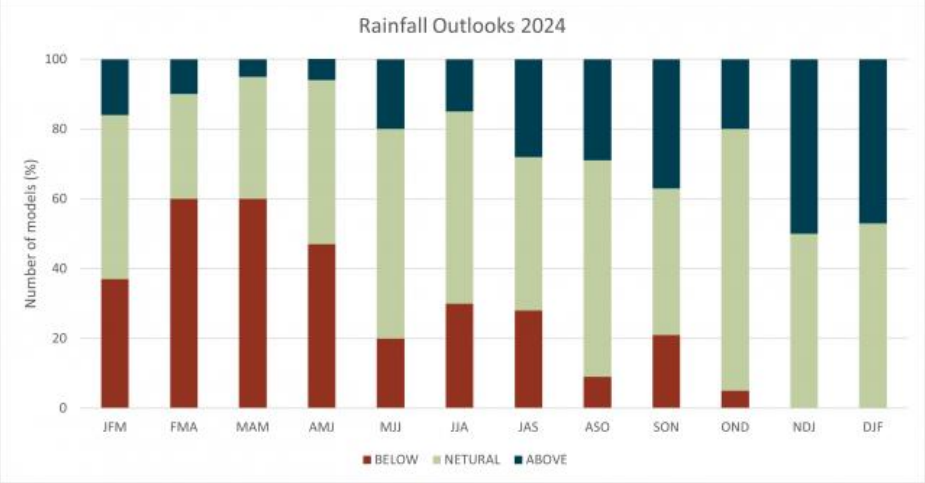

Fig 1. Model summary of rainfall outlook for the South West Land Division up to December 2024 to February 2025, with models indicating either a neutral chance of exceeding median rainfall or above median rainfall.

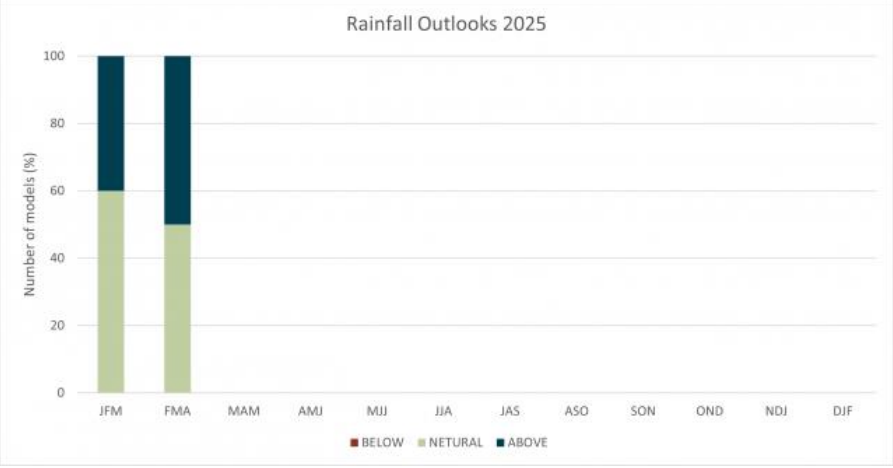

Fig 2. Model summary of rainfall outlook for the South West Land Division up to February to April 2025, with majority of models indicating a neutral chance of exceeding median rainfall.

Frost occurrence maps

Average frost occurrence maps can provide insight into the risk of frost on your farm. The frost occurrence map for 1 August – 31 October 2024, compared to the average map for 2000–2023, indicates that for the majority of the SWLD, the number of nights below 2°C is lower than average.

Minimum temperatures have been well above average from August through October. However, some locations have experienced more nights below 2°C than the 2000–2023 average, with Wickepin North recording 29 nights below 2°C. Notably, temperatures below 2°C were reported in late October at Salmon Gums, which is unusual.

The frost occurrence 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.

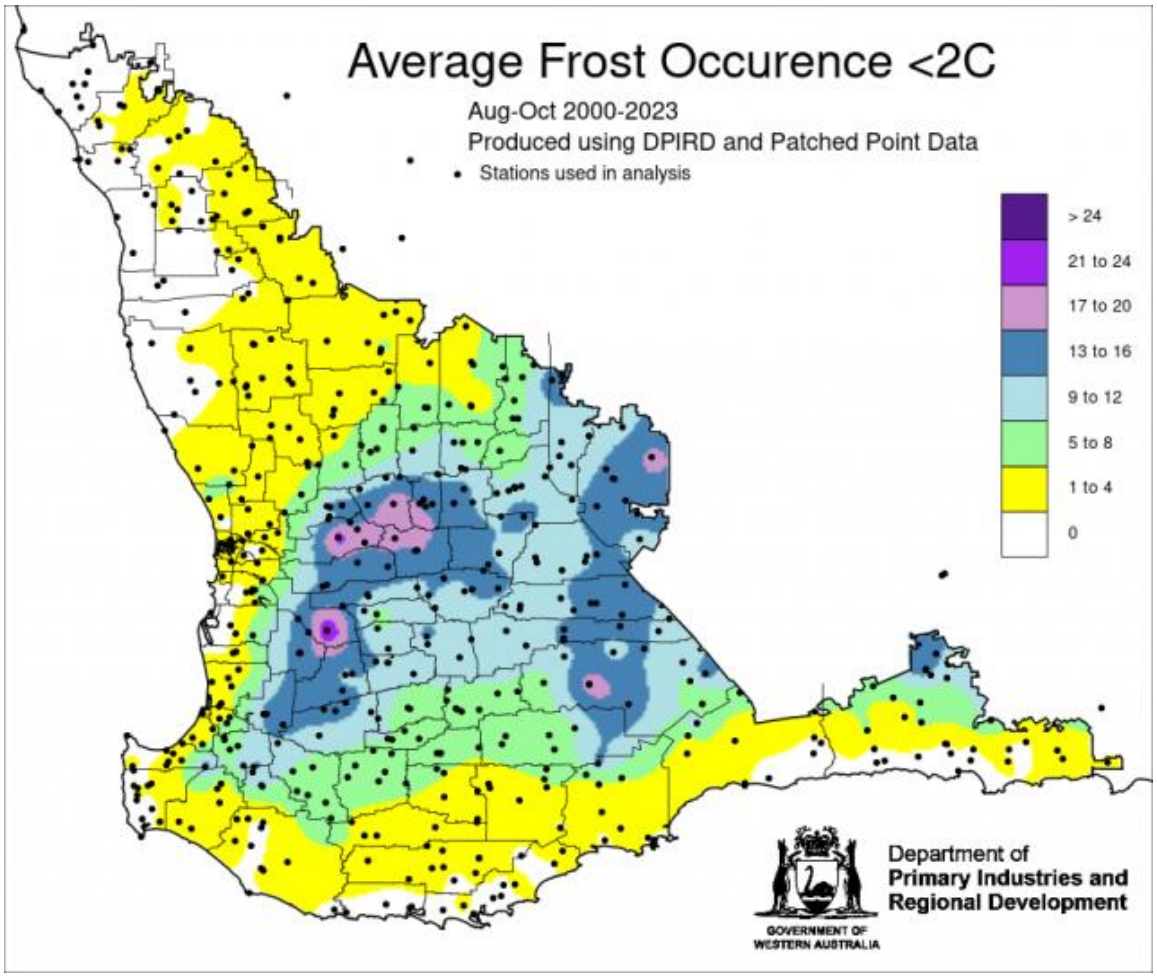

Fig 3. Average number of nights below 2°C for August-October 2000-2023 for the South West Land Division. Wandering has the highest average, with 25 nights below 2°C.

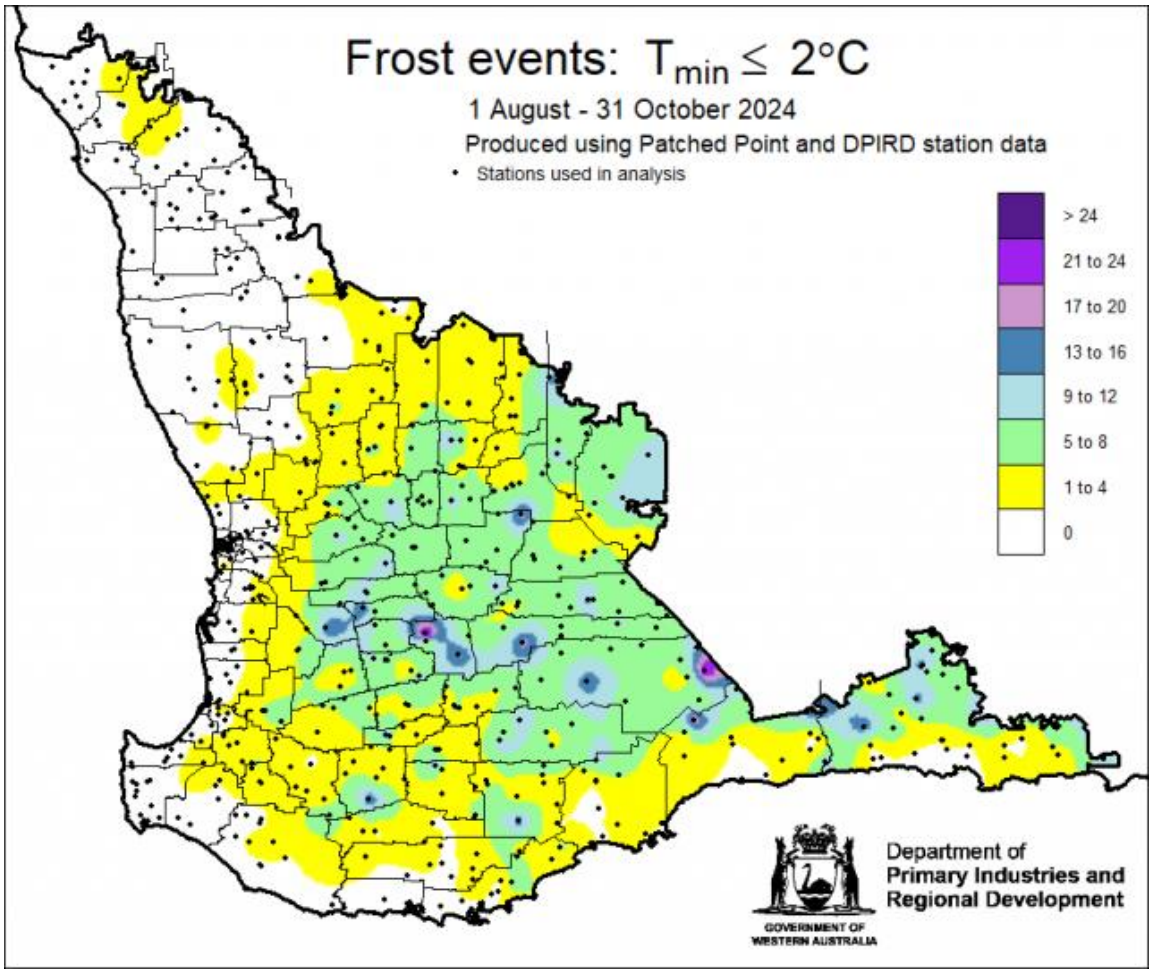

Fig 4. Number of nights below 2°C for August-October 2024 for the South West Land Division. Wickepin North had the most number of days with frost potential, with 29 nights below 2°C, elsewhere it has been a warmer than usual.

Heat occurrence maps

Maps of the South West Land Division, showing the number of days below 32°C from August to November, can highlight areas where heat stress is a concern. Temperatures above 32°C during the flowering and grain-filling stages can negatively impact yield by reducing pollen viability, which subsequently reduces grain size, weight, and alters protein content.

The map showing the average number of days above 32°C from August to November for 2000–2023 indicates that the Central West forecast district experiences the most heat days, with the season typically ending in September as a result. For instance, Mullewa records an average of 25 days above 32°C. In contrast, 2024 has been relatively mild in terms of heat events so far, with Bindoo recording 14 days above 32°C through the end of October.

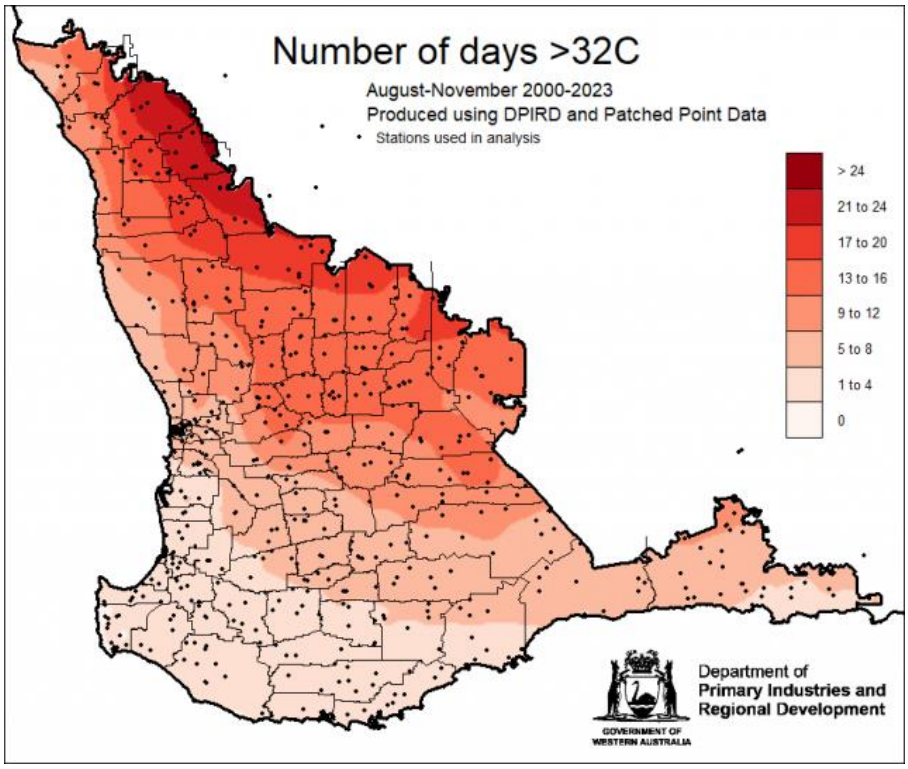

Fig 5. Average number of days above 32°C for August-November 2000-2023 for the South West Land Division. Mullewa has the highest average, with 25 days above 32°C.

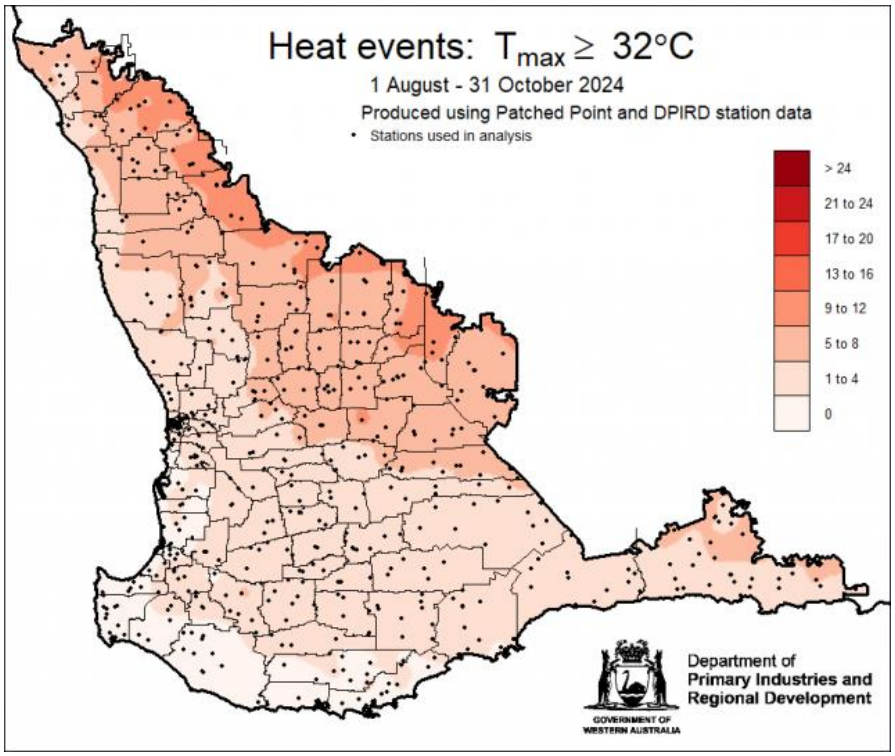

Fig 6. Number of days above 32°C for 1 August- 31 October 2024 for the South West Land Division. Bindoo has the highest number of days with heat stress, with 14 days above 32°C.

Recent climate

Growing season rainfall (1 April–31 October) for 2024 was generally average (decile 4-7) across the South West Land Division. Rainfall in the range of decile 1-3 was recorded along the south coast and throughout parts of the grainbelt, while the northern wheatbelt and south-west corner experienced decile 8-10 rainfall, with decile 4-7 elsewhere. The highest rainfall was recorded in Northcliffe at 1137 mm (decile 8), and the lowest in Nungarin, with 136 mm (decile 1).

In terms of climate drivers, 2024 was a neutral year for both ENSO (El Niño Southern Oscillation) and the IOD (Indian Ocean Dipole). The last neutral year for both drivers was 2018, which also saw below-average rainfall for the Great Southern, South Coastal, and South East Coastal regions—similar to this year. The Southern Annular Mode, another key climate driver, was negative in August, leading to above-average rainfall that month.

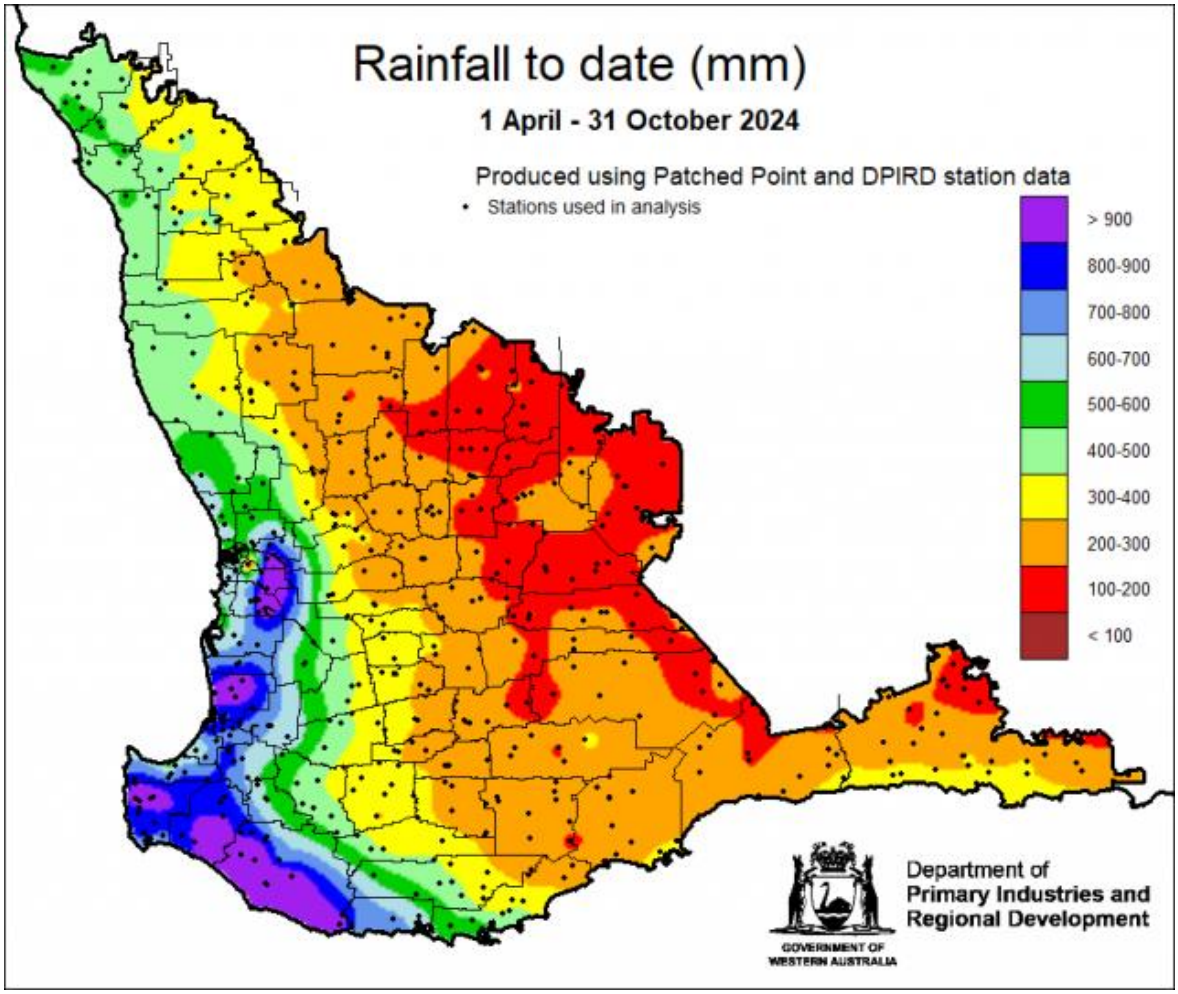

Fig 7. Rainfall map for 1 April to 31 October 2024 for the South West Land Division. Showing rainfall variability.

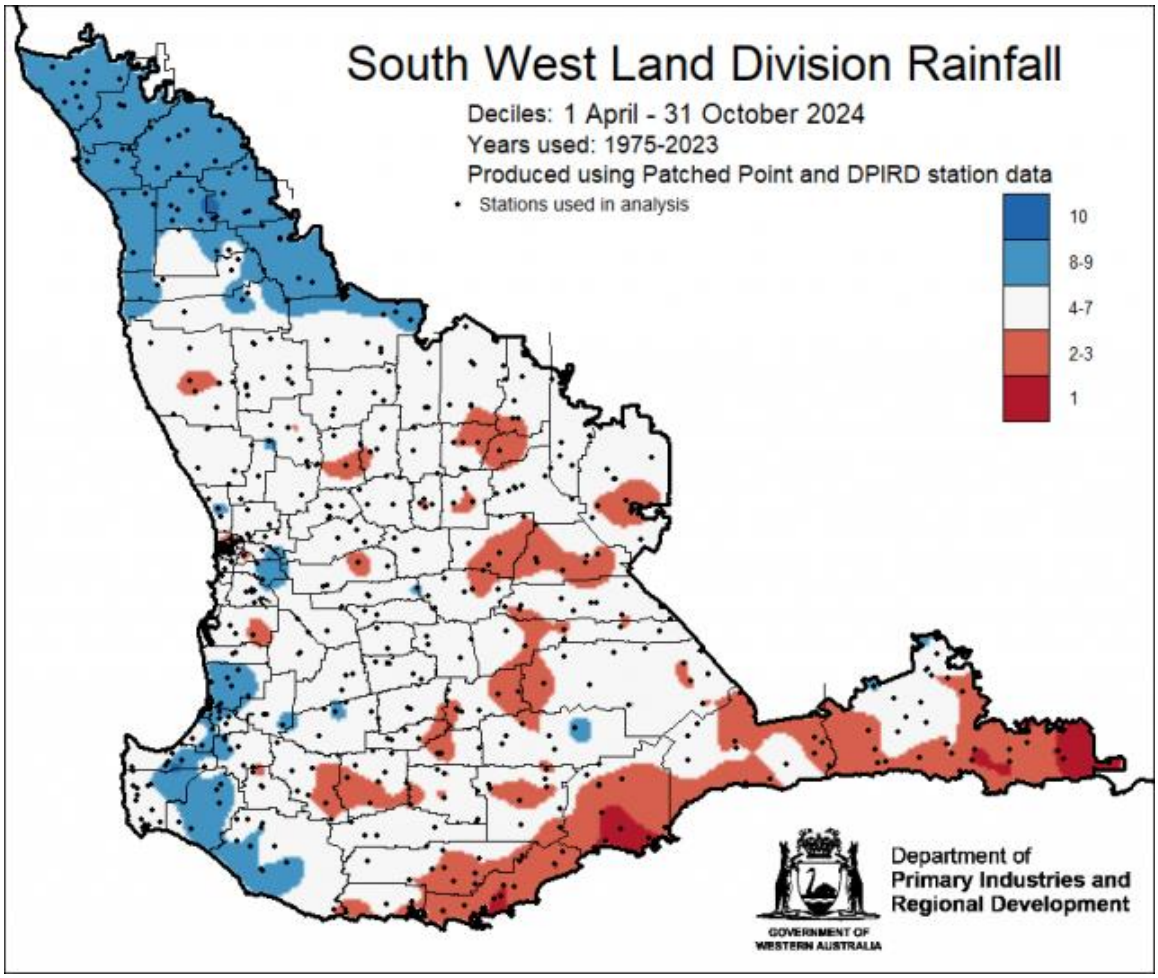

Fig 8. Rainfall decile map for 1 April to 31 October 2024 for the South West Land Division. Indicating decile 1-3 rainfall along the south coast and throughout the grainbelt, decile 8-10 for northern wheatbelt and south-west corner, decile 4-7 elsewhere.

The potential yield maps below represent the final maps for 2024, using April to October rainfall to determine the maximum possible wheat yield under ideal conditions, without additional constraints. Potential wheat yield is estimated using the French & Schultz potential yield model, expressed as:

Yield (tonnes/ha) = WUE * (stored soil water + growing season rainfall - evaporation)

where WUE stands for water use efficiency, and growing season rainfall is typically measured from April to October. Stored soil water at the start of the growing season is estimated as one-third of the summer rainfall. These maps consider three different WUE values: 12, 15, and 20 kg/ha/mm.

The lowest yield potential, with a WUE of 12, is 1.9 t/ha at Mukinbudin and Nungarin, while the highest yield potential is 13.7 t/ha at Northcliffe.

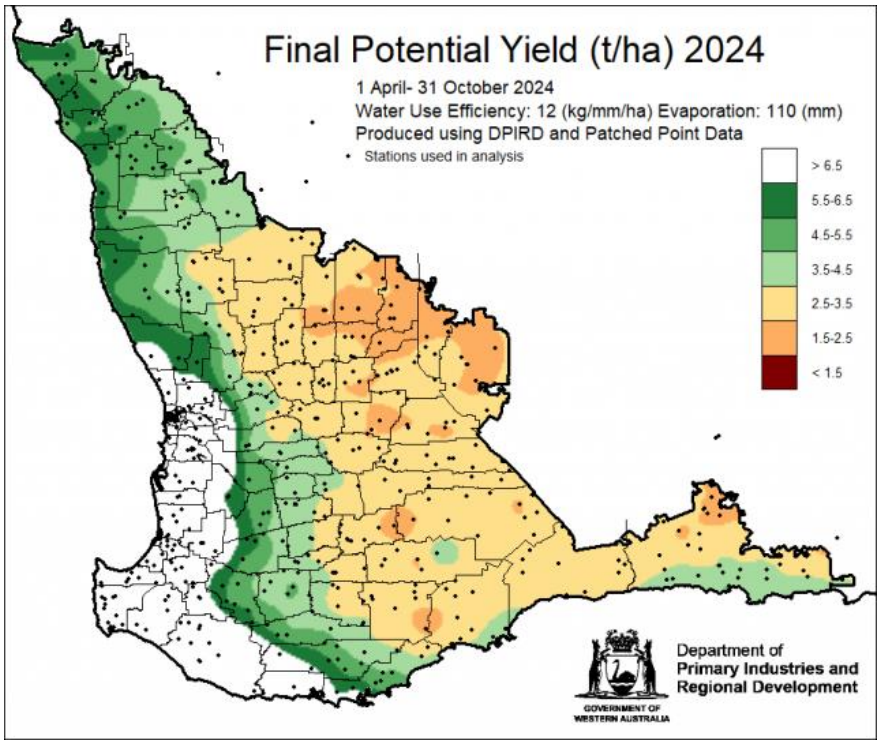

Fig 9. French and Schultz modelled final potential yield map for 2024 for the South West Land Division. Using water use efficiency of 12 kg/ha/mm and evaporation rate of 110 mm. All of the South West Land Division have exceeded a potential yield of 1.5 t/ha.

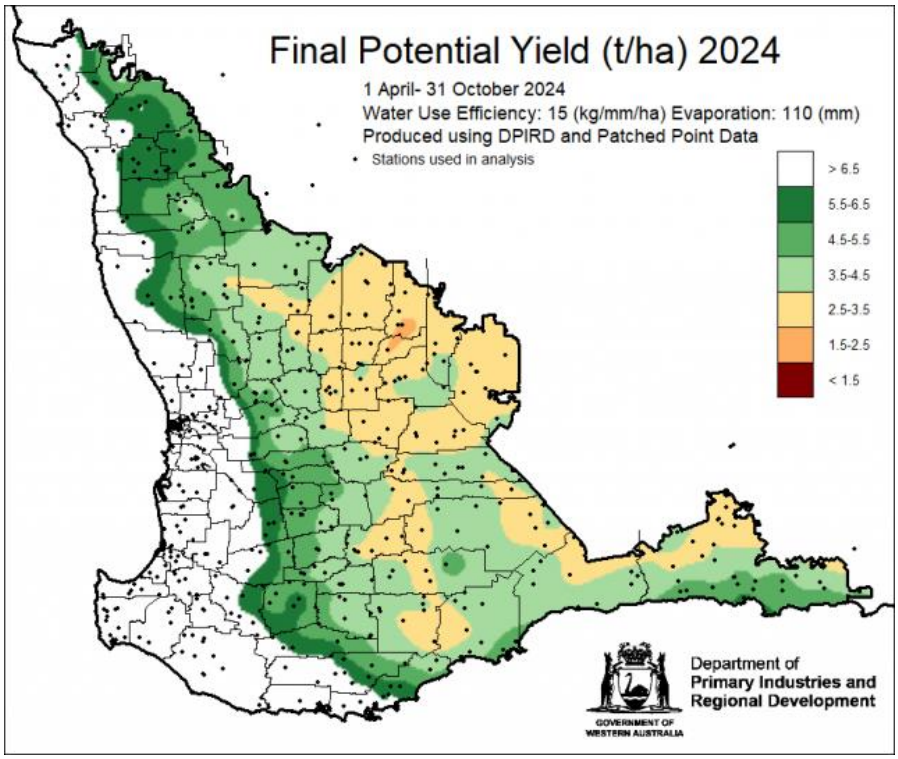

Fig 10. French and Schultz modelled final potential yield map for 2024 for the South West Land Division. Using water use efficiency of 15 kg/ha/mm and evaporation rate of 110 mm. Showing some locations in the Central West forecast district have exceeded a potential yield of 6.5 t/ha.

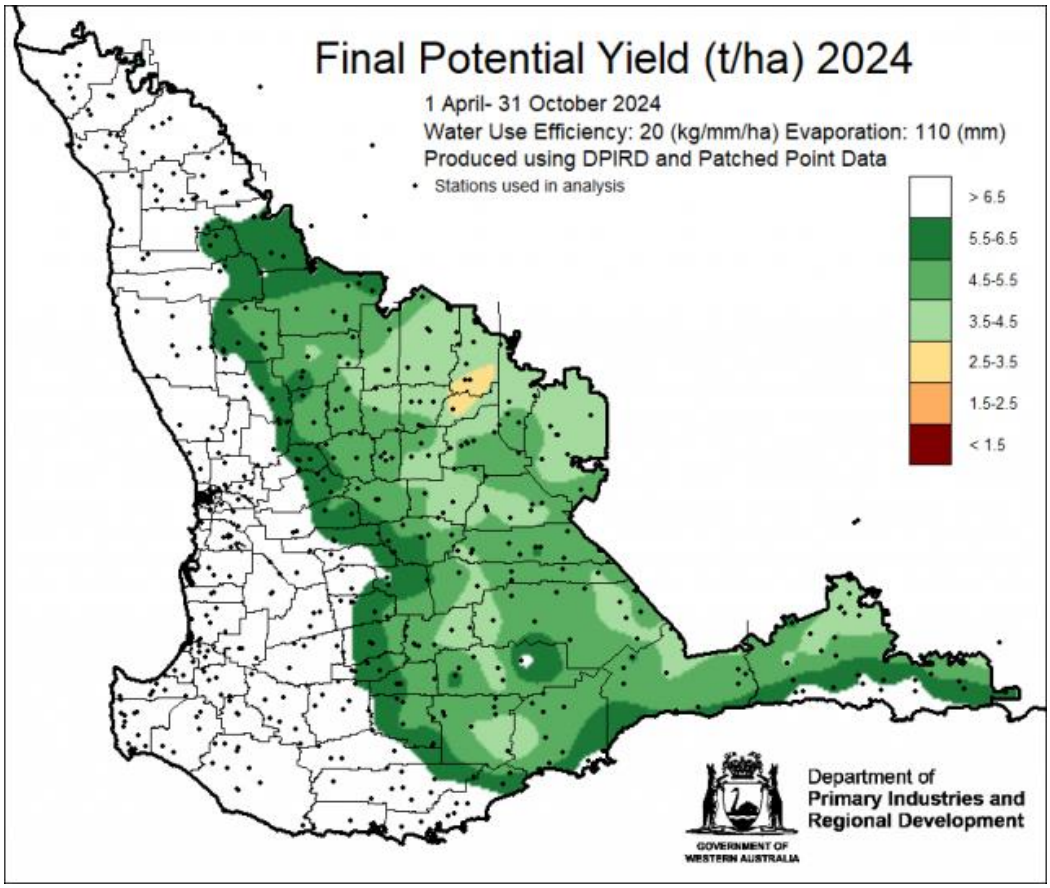

Fig 11. French and Schultz modelled final potential yield map for 2024 for the South West Land Division. Using water use efficiency of 20 kg/ha/mm and evaporation rate of 110 mm. Showing majority of the grain belt have exceeded potential yield of 3.5 t/ha.
