SEASONAL CROP OUTLOOK

Wheat – August 2021

SUMMARY

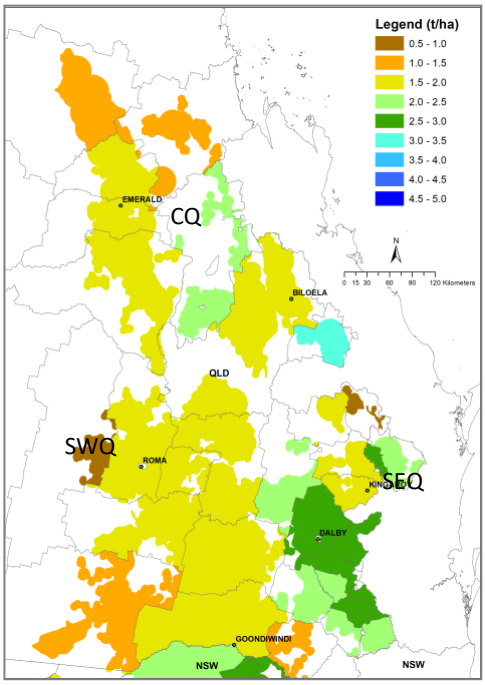
The current winter crop outlook for Queensland as a whole indicates a predicted crop yield of 2.20 t/ha, which is 15% above the long-term median yield expectation, which is within the top 20% of yield outcomes relative to all years. This improvement in the crop outlook is a combination of the above average rainfall recorded during July and the increased chance of rainfall during the next three months across most of the state's winter crop area. Specifically, SEQ, SWQ and CQ all have yield outcomes ranked in the top 30% of all years and yield departures of 12%, 17% and 19% above the long-term median, respectively. The range of yield predictions, at state level, will narrow considerably over the next few months as the outlook is updated through the season.

GENERAL CONDITIONS

Rainfall during July was average to above average for most parts of the state's winter cropping region. Furthermore, rainfall during March to July was variable and average to below average across most of the cropping region. This resulted in some late planting opportunities during the conclusion of the traditional sowing window period. The traditional planting window has now closed.

The recent pattern of the SOI, "rapidly rising" at the end of July, indicates rainfall chances similar to climatology (50:50) for southern QLD, but increased chances for above average rainfall in most other parts of the state's cropping region over the next 3-months (www.longpaddock.qld.gov.au). This, however, will change depending on the movement in the SOI as the season progresses over the next month. At this stage, atmospheric indicators for ENSO are in a NEUTRAL mode.

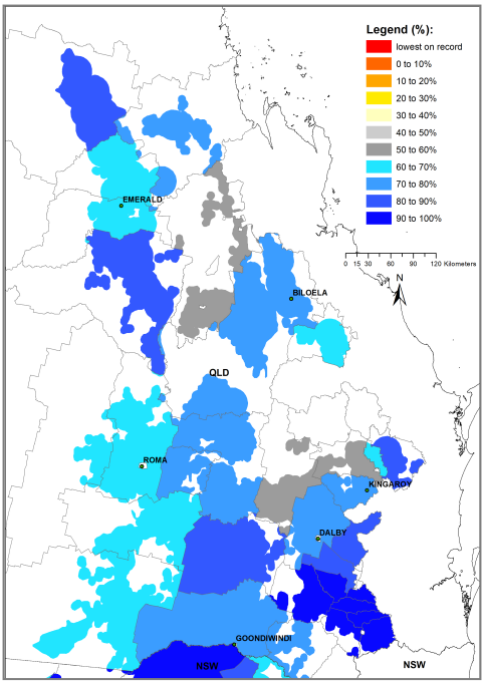
Progress of the climate indicators such as the SOI and sea surface temperature anomalies can be followed here (www.bom.gov.au/climate/enso).



Map 1: Simulated long-term median shire yield derived from the last 121-years with current technology.

OUTLOOK

This regional wheat crop outlook is based on the assumption of cropping after summer fallow. The benchmark for this outlook is the simulated long-term median shire wheat yield within the broad cropping region of Queensland (Map 1). The median yield is based on predicted performance over the past 121-years using an agro-climatic model for wheat with long-term rainfall records (see descriptive note for more details). The percentile and percentage departure of the forecast median for this season from the long-term median shire wheat yield are given in Maps 2 & 3. Any areas coloured in yellow to red are ranked below to very much below the long-term median, while areas coloured in green to blue are ranked above to very much above the long-term median. Areas in grey are ranked similar to the long-term median shire wheat yields relative to all years.



Map 1: Forecast median shire yield ranked relative to all years (%).

WORKING TOGETHER WITH THE QUEENSLAND GOVERNMENT

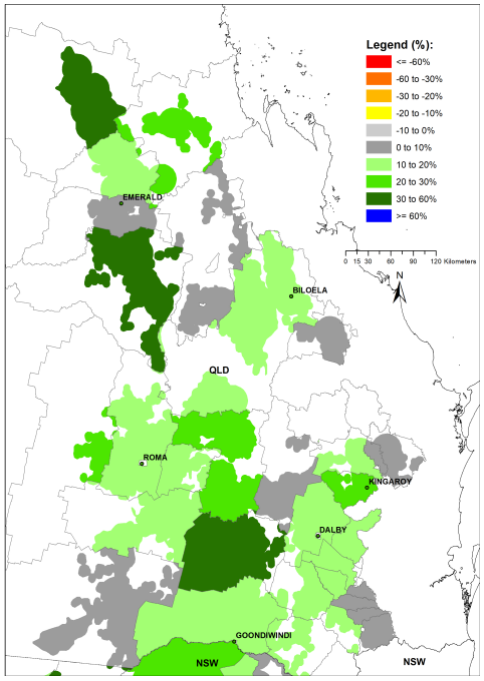
Map 2 and 3 are derived by considering conditions up to the end of July and projecting forward based on rainfall conditions in years from the historical record with SOI phase similar to this year - "rapidly rising" in June/July. The calculation of benchmark yields, and outlook chances do not take into account effects of poor crop nutrition or damage due to pests, diseases, frosts, or extreme events.

Forecast yield outcomes (Map 2) vary geographically with almost the entire state's cropping region having yield outcomes expected to be above average. Specifically, yield outcomes for all regions are falling above the 30th percentile of all years (i.e. in the highest yielding 30% of years; Map 2).

Percentage departure of the forecast median yield from the long-term expectation is shown in Map 3. The spatial pattern is similar to that of the predicted percentile yields with positive deviations of between 10% to 30% for almost the entire state's winter crop region. Note that this forecast only takes into account those areas that could be planted.

Poor Crop Chance

With the sowing window now closed, there are no regions with a highly increased chance of predicted wheat yield being below the bottom 10% yield of all years (data not shown). It should be noted that these values are calculated as broad indicators for shire scale. They do not apply to farm level.

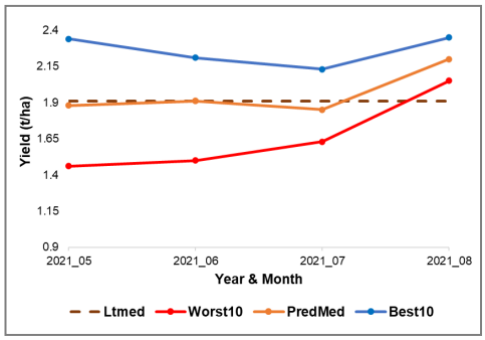


Map 2: Percentage departure of the forecast shire median yield from the long-term shire median wheat yield.

State Outlook

At present, the current state wheat outlook shows a forecast median yield at the end of July of 2.2 t/ha, which is well above the long-term median of 1.91 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 2.05 t/ha or higher than 2.35 t/ha. With almost 90% of the forecast distribution now falling above the long-term median expectation, the current forecast indicates an above average-yielding crop for the state as a whole.

At regional level, Southwest Qld (SWQ), Southeast Qld (SEQ) and Central Qld (CQ) (see Map 1), the forecast yield (t/ha) ranges are as follows:



Graph A: State level yield forecast trajectories (10th, 50th and 90th percentiles).

Region	Worst 10%	Median (50%)	Best 10%	LT-median
SWQ	1.77	1.97	2.22	1.67
SEQ	2.51	2.68	2.82	2.39
CQ	2.04	2.05	2.05	1.72

All regions are having forecast medians above the long-term median expectations and are 1.97 t/ha, 2.68 t/ha and 2.05 t/ha for SWQ, SEQ and CQ, respectively. The SOI phase has moved from neutral to "rapidly rising" at end of July and reflects an increased chance (60-70%) for above average rainfall, over the next 3-months in most of southern parts of QLD.

Descriptive Note:

The seasonal wheat outlook is based on the integration of (i) a simple agro-climatic wheat stress index model (Oz-Wheat MII) (i.e. Bare fallow routine - Ritchie, 1972; Wheat stress index model adapted from - Fitzpatrick and Nix, 1969; Nix and Fitzpatrick, 1969), which is sensitive to water deficit or excess during the growing season, (ii) actual climate data up to the forecasting date and (iii) projected climate data after that date. These projected data are drawn from historical analogue years based on similarity to the prevailing phase of the Southern Oscillation Index (SOI) (Stone et al., 1996). The Oz-Wheat model is run from the end of the wheat crop the year before sowing in order to account for the influence of the summer fallow on starting soil moisture conditions. The model input parameters for each shire (i.e. potential available water content, planting rain & stress index period) have been selected based on the best fit when calibrated against actual shire wheat yields from the Australian Bureau of Statistics (ABS) for the period 1976 – 2000, 2005, 2010 & 2015 (MII). Cross validated spatial correlation when predicting the shire wheat yields for the 2000 season (MI) was 0.8 across all main wheat producing shires in Australia (Potgieter et. al., 2006). For the updated MII 75% of the 237 shire have $R^2 > 0.60$.