SEASONAL CROP OUTLOOK

Wheat – August 2022

SUMMARY

The current winter crop outlook for Queensland indicates a predicted crop yield of 2.34 t/ha, which is 21% above the long-term median yield expectation and within the top 10% of yield outcomes relative to all years. This slight improvement in the crop outlook is a combination of the average to 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 20% of all years and yield departures of 13%, 21% and 38% above the long-term median, respectively. However, total area planted to winter crops are 24% below the long-term median area planted during the last six-years (2016-2021) at a state level (QLD). The range of yield predictions, at state level, will narrow considerably over the next few months as the outlook is updated through the season.

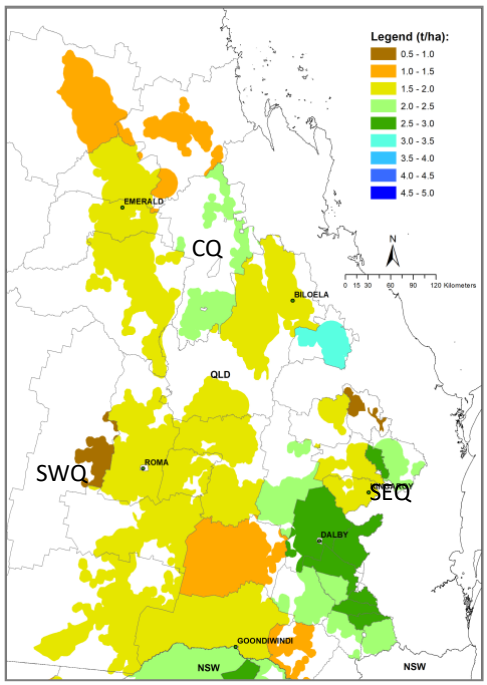
GENERAL CONDITIONS

Rainfall during July was average to above average for most parts of the state's winter cropping region. Furthermore, rainfall during April to July was well above average to very much above 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.

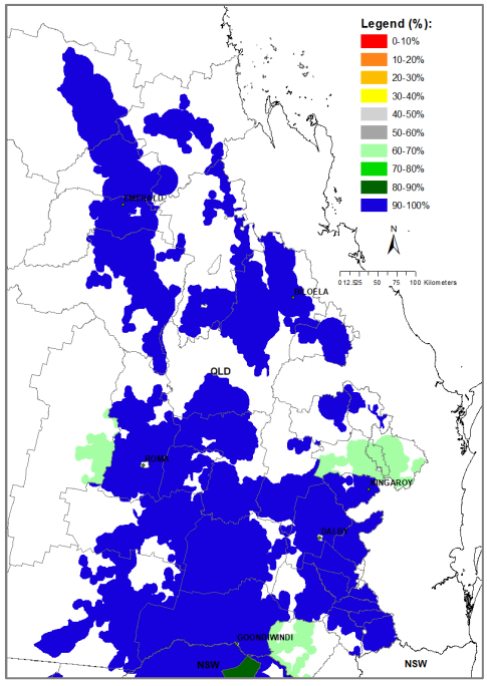
Prospects for projected in-crop rainfall based on the recent pattern of the SOI, i.e. "consistently positive" for the July-August period, indicates an increased chance for an above average rainfall in most parts of the state's winter cropping region over the next 3-months. Previous years, during the last 30-years, that had a similar SOI phase were 1981, 1986, 1989, 1996, 1998 & 2013 (www.longpaddock.qld.gov.au). In addition, the SOI has been in consistently positive phase since March 2022. However, this will change depending on the movement in the SOI as the season progresses over the next month. Crops sown into profiles with low soil water are more dependent on in-crop rainfall, and in such situations, forecasts based on SOI phases can be most useful. At this stage, atmospheric indicators for ENSO remains at a La Niña WATCH 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).

OUTLOOK

This regional wheat crop outlook assumes 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 probability of exceeding the long-term median shire wheat yield for the coming season is shown in Map 2. Any areas coloured in yellow to red have a reduced chance of exceeding the median yield, whereas areas coloured in green to blue have an increased chance. The percentage departure of the forecast median for this season from the long-term median shire wheat yield is given in Map 3. Maps 2 & 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 like this year - "consistently positive" in June-July. The calculation of benchmark yields and outlook chances do not consider effects of poor crop nutrition or damage due to pests, diseases, frosts, or extreme events. This outlook is derived assuming only a summer (short) fallow period.



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



Map 2: Probability of exceeding the long-term simulated median shire wheat yield.

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The current state wheat outlook shows chances remain highly favourable for an above average yield (t/ha) crop across most of the state's cropping area (Map 2). Specifically, almost the entire winter cropping region has a highly increased chance (>80%) of exceeding the long-term shire yield expectation. Map 3 shows that for this season, most areas in SEQ, SWQ & CQ have positive forecast median yield deviations of 13%, 21% and 38% above the long-term median for that region, respectively.

It should be noted that at this stage of the season, there is some variability in likely yield outcomes for the 2022 season (see State Outlook section). Updating of actual climate and thus shortening of the forecast period will cause the range of yield outcomes to further narrow towards the final realised yield at the end of the season.

Winter cropping

At present, this early in the growing season, likely total winter crop area sown, relative to all available potential land areas (excluding current unharvested summer crops), is around 2.45 M hectares across the entire NEAUS winter cropping region. This approach currently relates to winter crops planted at start of August. This is around 18% below the total long-term median area planted to winter crops from 2016-2021 for the entire NEAUS cropping region. Areas for winter crops were derived by utilising high-resolution satellite imagery (return period of 5-days) and mathematical algorithms applied to current land use cropping patterns (source: CropVision ARC LP).

State Outlook

At present, this early in the season, the current state (QLD) wheat outlook shows a forecast median yield at the start of July of 2.34 t/ha (long-term simulated median of 1.93 t/ha), which is very much above the long-term median yield (Graph A). There is however, a 10% chance that the state yield could be lower than 2.25 t/ha or higher than 2.50 t/ha.

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:

Region	Worst 10%	Median (50%)	Best 10%	Lt median
SWQ	1.83	2.03	2.35	1.68
SEQ	2.68	2.75	2.78	2.44
CQ	2.40	2.41	2.44	1.75

Forecast medians for SWQ (2.03 t/ha), SEQ (2.75 t/ha) and CQ of 2.41 t/ha remain well above the long-term median expectation for regional wheat yields for those regions. The SOI phase of "consistently positive" at end of July indicates an increased chance for above average rainfall in most parts of the state's cropping region rainfall over the next 3-months. There remains, however, some range of possible outcomes that will depend on conditions in the remainder of the growing season.

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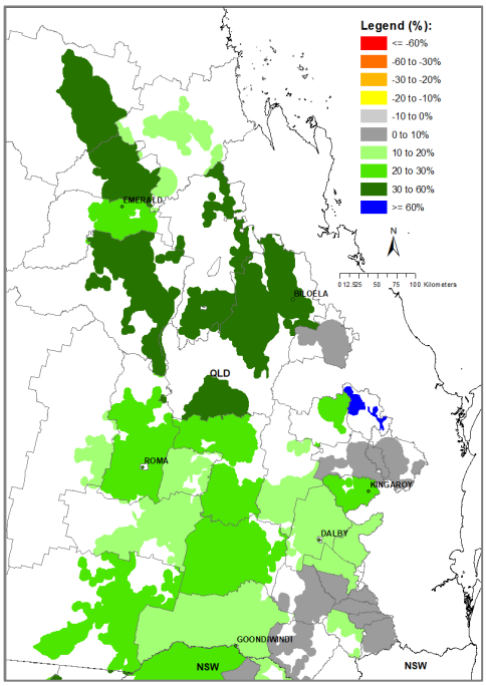
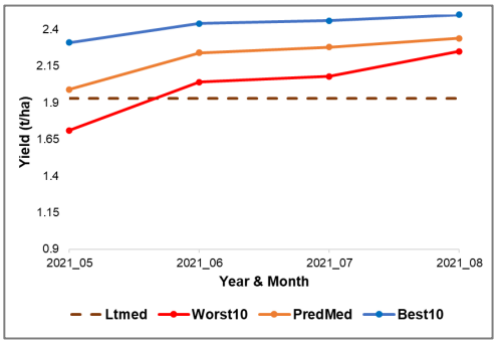


Map 3: Percentage departure of the current forecast median shire yield from the long-term shire median



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

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 1 October the year before sowing 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 $R^2 > 0.60$.