

# SEASONAL CROP OUTLOOK

Wheat – June 2016

## SUMMARY

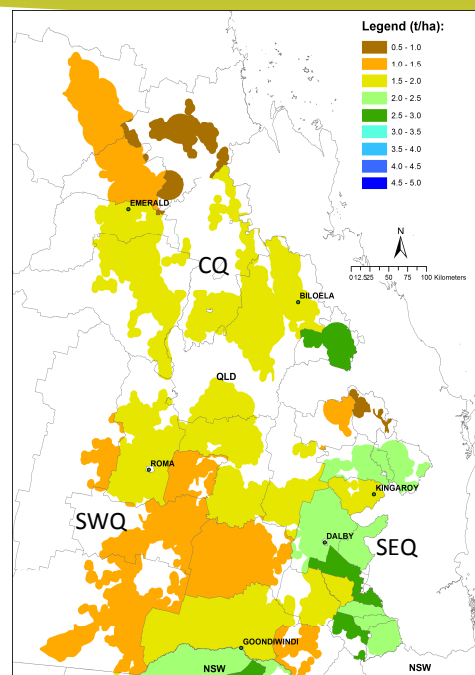
The current winter crop outlook for the state as a whole indicates a predicted median crop yield slightly below the long-term expectation (31<sup>st</sup> percentile ranking relative to all years). This incorporates current *soil water conditions* and the *seasonal rainfall outlook* based on the southern oscillation index. However, variation in the probability of exceeding the long-term median yield exists within the state's broad cropping region. Most parts of southern QLD's cropping region are showing slightly reduced chances of exceeding the long-term median wheat yield. In contrast, most parts of the central Highlands in CQ are having chances similar to the long-term median of exceeding the long-term median yield. This early in the season, widespread above average rainfall is needed during the next couple of months to induce good planting opportunities and improve current cropping season conditions. Note that all atmospheric and ocean indicators of ENSO are currently indicating a "neutral" status, which marks the end of the past El Niño event of 2015-16. However, the likely range of yield outcomes is still very wide. This range will narrow considerably over the next few months as the outlook is updated through the season. Seasonal rainfall projections using historical analogue years based on SOI phases become more skilful for much of Queensland towards the end of June to July and it is recommended to follow the development of the SOI during the next couple of months closely.

## GENERAL CONDITIONS

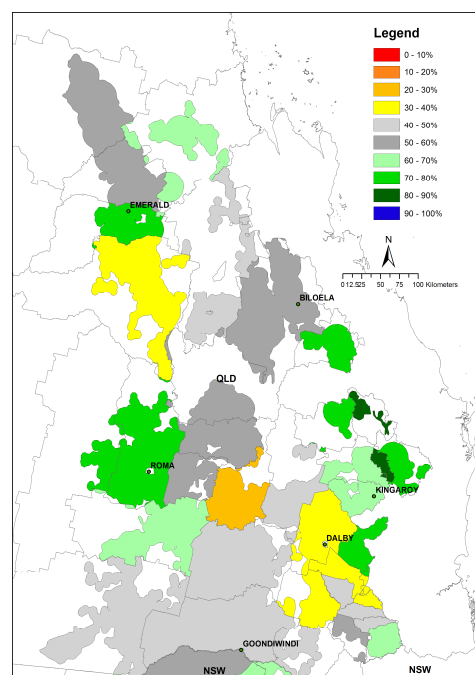
Apart from some parts in CQ, which received average to above average rainfall, below average rainfall was recorded during December to end of May across most parts of QLD's cropping region. However, rainfall received during May was average for most parts of FAR SWQ, while the remainder of the state's cropping region recorded below average rainfall during May. This resulted in poor replenishment of soil water levels in most of the state's cropping region (Map 2). Specifically, soil moisture profile levels are around 30-40% for most of SEQ (deeper soils), while parts of SWQ and CQ (shallower soils) are having soil moisture at close to half full profiles (50-70%). Although some rain was recorded during the past few days (1<sup>st</sup> week of June) most of this rainfall fell outside of the main winter cropping region and is unlikely to recharge soil moisture profiles. However, sowing will occur in those regions that did receive significant rainfall and have close to full profiles. The recent pattern of the SOI, "rapidly rising" for the April-May period, indicates slightly increased chances of above average rainfall in most southern parts of the QLD cropping region, over the next 3-months, respectively, ([www.longpaddock.qld.gov.au](http://www.longpaddock.qld.gov.au)). Chances in the remainder of the states are similar to climatology (50:50). This however, 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. Progress of the SOI should be followed closely during the next few months, particularly as the Bureau's ENSO Tracker has suggested an increased chance of a likely La Niña event developing later this year (24 May, [www.bom.gov.au](http://www.bom.gov.au)).

## 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 115-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 3. 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.



Map 1: Long-term median simulated shire yield using 2015 technology (115 years)



Map 2: Aggregated soil water recharge status (%) as at 1<sup>st</sup> June 2016. Summer fallow simulated from 1<sup>st</sup> of October the previous year.

Map 3 is derived by considering conditions up to the end of May and projecting forward based on rainfall conditions in years from the historical record with SOI phase similar to this year - “rapidly rising” in April/May. 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. This outlook is only applicable to a summer (short) fallow period. The current state wheat outlook, at this very early stage in the season, varies across most of the state’s cropping area. Specifically, chances of exceeding the long-term median yield are close to average (50:50) for most parts of the central highlands of CQ. In contrast, almost all of southern QLD’s cropping region (SWQ and SEQ) are showing slightly below average chances (30% to 40%) of exceeding the long-term shire yield expectation. Widespread above average rainfall during the next month is needed to induce plantings and significantly improve the current wheat yield outlook for most of the state’s cropping region.

It should be noted that at this stage of the season, there is a wide range of likely yield outcomes for the 2016 season (see State Outlook section) as all of the growing season remains in the projected forecast. The current seasonal climate forecast skill will improve towards the end of July. Updating of actual climate and thus shortening of the forecast period will cause the range of yield outcomes to narrow towards the final realised yield at the end of the season.

### POOR CROP CHANCE

At present, this early in the growing season, some parts of northern CQ and SWQ are showing slightly increased chances (20% to 30%) for wheat yield being similar to the worst 10% 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.

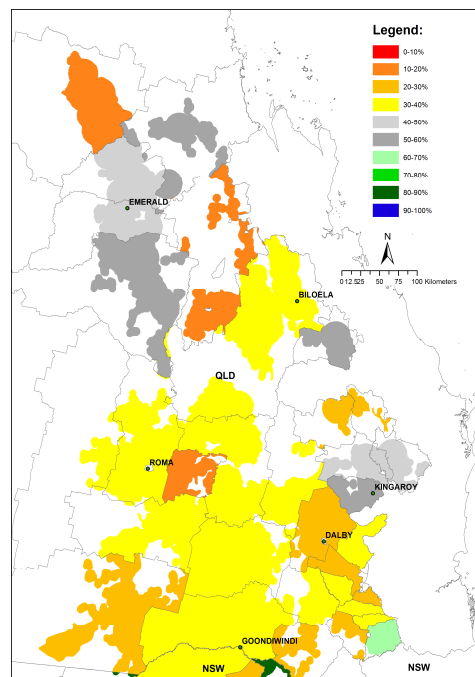
### STATE OUTLOOK

The current state wheat outlook shows a forecast median yield at the end of May this year of 1.45 t/ha, which is slightly below the long-term median of 1.68 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 1.04 t/ha or higher than 1.85 t/ha. At present - this early in the season - the forecast indicates a slightly below average-yielding crop for the state as a whole. However, keep in mind that it is very early in the growing season and that widespread above average rainfall during the next 3-months is needed to induce good sowing conditions and improve the outlook at shire and regional scales.

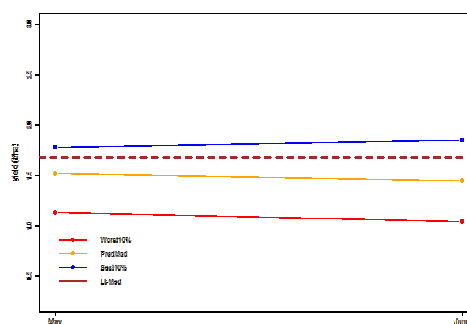
At regional level, Southwest Qld (SWQ), Southeast Qld (SEQ) and Central Qld (CQ) (see Map 1), the forecast yield (t/ha) ranges are as follows:

Region	Worst 10%	Median (50%)	Best 10%	Lt median
SWQ	0.86	1.16	1.73	1.51
SEQ	1.43	1.83	2.31	2.13
CQ	0.96	1.40	1.67	1.50

Forecast medians for SWQ (1.16 t/ha) and SEQ (1.83 t/ha) are below the long-term median expectation for regional wheat yields, while the yield outcome in CQ of 1.40 t/ha is similar to the long-term median for that region. The SOI phase of “rapidly rising” at end of May indicates slightly increased chances of above average rainfall over the next 3-months for most areas of QLD’s cropping region. There remains, however, quite a wide range of possible outcomes that will depend on conditions in the remainder of the growing season. However, given the increasing skill in forecasts as the season progresses, it is advisable to closely monitor progress of the SOI over the next couple of months, specifically with cooler-than-average sea surface temperatures continue to develop in the equatorial Pacific ([www.bom.gov.au](http://www.bom.gov.au)).



Map 3: Probability of exceeding the long-term simulated median shire wheat yield.



Graph A: State level yield forecast trajectories (10<sup>th</sup>, 50<sup>th</sup> and 90<sup>th</sup> 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 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 1975 – 2000, 2005 & 2010 (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<sup>2</sup> > 0.60.