

# SEASONAL CROP OUTLOOK

## Wheat – July 2017

### SUMMARY

The current winter crop outlook for the state as a whole indicates a predicted crop yield of 1.31 t/ha, which is 21% below the long-term median yield expectation of the state. This outlook incorporates current soil water conditions and the seasonal rainfall outlook based on the southern oscillation index. The protracted drier than average conditions during June has resulted in an unfavourable start to the winter cropping season for most of QLD's cropping region. Specifically, some parts of SWQ and southern CQ have yield outcomes ranked in the bottom 20% of all years, while most parts of southern QLD have yield outcomes ranked in the 20<sup>th</sup> to 40<sup>th</sup> percentiles. Widespread above average rainfall is needed during the next month to improve the current below average outlook. The range of yield predictions will narrow considerably over the next few months as the outlook is updated through the season.

### GENERAL CONDITIONS

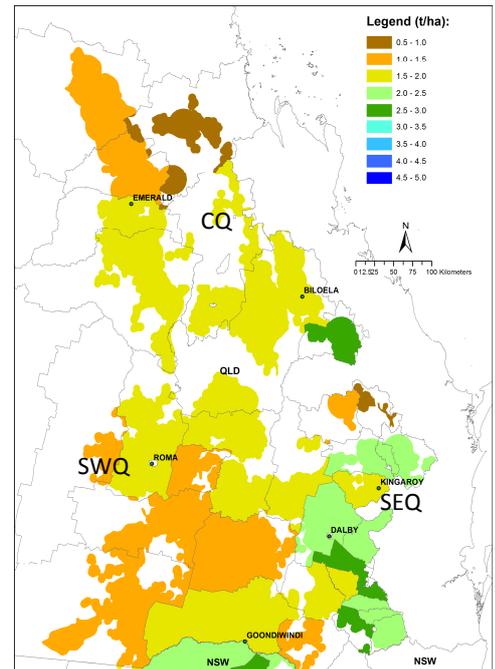
The aggregated soil moisture map suggests that some regions in CQ and SEQ have soil moisture profiles around ¾ of potential available water content (PAWC). This was mainly due to the above average rainfall recorded at the end of March due to the land-fall of cyclone "Debbie". However, since then, no significant rainfall events have been recorded and protracted dry conditions continued through till end of June across most of the QLD's winter cropping region. Furthermore, rainfall recorded during April to June was below to very much below average for the state. This resulted in poor replenishment of the soil moisture profiles across the winter cropping region. Overall, available soil water levels

remain below to very much below ½ (<50%) of the potential available water content (PAWC) for most of the state's cropping region. The exception was for parts of the southern Darling Downs, which had soil moisture levels above 75% partly due to average rainfall recorded during June for that region (Map 2). Very few sowing opportunities occurred during the traditional planting window, which is now nearing its end.

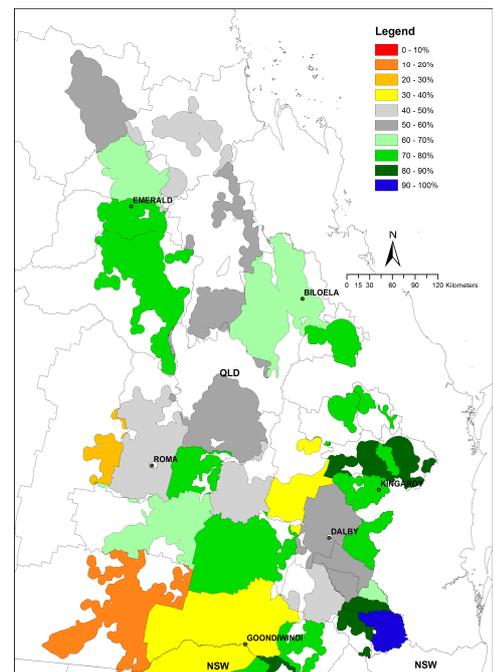
The recent pattern of the SOI, "rapidly falling" for the May-June period, indicates chances similar to climatology (50:50) for above average rainfall in most parts of the state's cropping region over the next 3-months ([www.longpaddock.qld.gov.au](http://www.longpaddock.qld.gov.au)). This however, will 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. However, atmospheric indicators of ENSO are now suggesting an ENSO "NEUTRAL" state.

### 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). Forecast median shire yield ranked relative to all years (%) 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 2017 technology (115 years)



Map 2: Aggregated soil water recharge status (%) at 1<sup>st</sup> July 2017. 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 June and projecting forward based on rainfall conditions in years from the historical record with SOI phase similar to this year - “rapidly falling” in May/June. 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 derived assuming a summer (short) fallow period. A similar spatial outlook pattern of below to very much below average wheat yields are forecast across the entire state. Specifically, predicted yield outcomes for most of southern QLD are falling between the 20<sup>th</sup> to 40<sup>th</sup> percentiles relative to all years. While parts of southern CQ and SWQ have predicted yield outcomes in the bottom 20% of all years. Widespread above average rainfall during the next month will be critical to induce some late plantings and significantly improve the current wheat yield outlook for most of the state’s winter cropping region.

It should be noted that at this stage of the season, there is a wide range of likely yield outcomes for the 2017 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

With the sowing window nearing its end in most regions, almost all parts of the SWQ are showing increased chances (> 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.

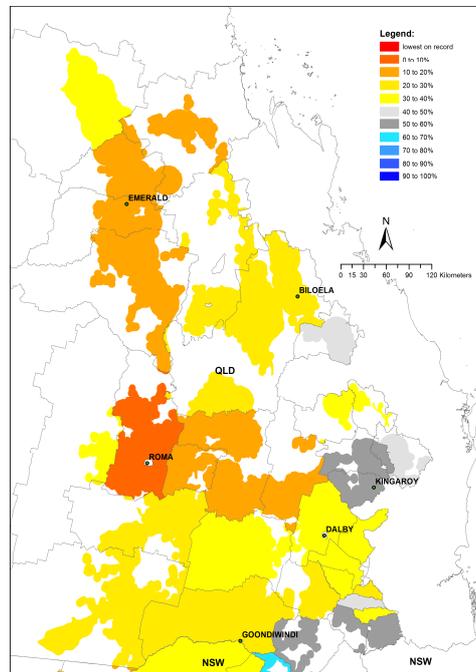
### STATE OUTLOOK

The current state wheat outlook shows a forecast median yield at the end of June this year of 1.31 t/ha, which is below the long-term median of 1.65 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 1.11 t/ha or higher than 1.78 t/ha. The forecast indicates a below average-yielding crop for the state as a whole. Widespread above average rainfall during the next month is needed to prevent the outlook deteriorating further at shire and regional scales.

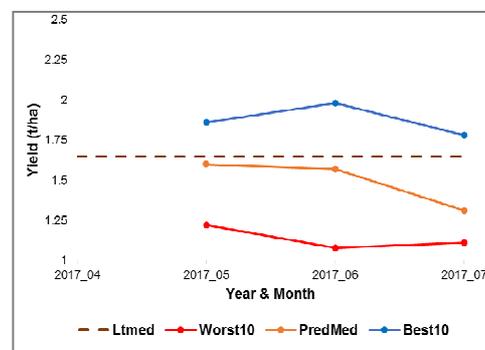
At regional level, Southwest Qld (SWQ), Southeast Qld (SEQ) and Central Qld (CQ) (see Map 1), the forecast yield (t/ha) ranges are as follows:

Region	Worst 10%	Median (50%)	Best 10%	Lt median
SWQ	0.78	0.99	1.58	1.53
SEQ	1.44	1.96	2.36	2.13
CQ	1.07	1.14	1.50	1.52

Forecast medians have reduced to below the long-term median expectations for all regions of the state. Specifically, SWQ, SEQ and CQ have forecast medians of 0.99, 1.96 and 1.14 t/ha, respectively. The SOI phase of “rapidly falling” at end of June indicates a chance similar to climatology (50:50) for above average rainfall, over the next 3-months in most of the state’s winter cropping region. There still remains, however, a wide range of possible outcomes that will depend on conditions in the remainder of the growing season.



Map 3: Forecast median shire yield ranked relative to all years (%)



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.