

# SEASONAL CROP OUTLOOK

Wheat – September 2017

## SUMMARY

The current winter crop outlook for the state as a whole indicates a predicted crop yield of 1.17 t/ha, which is 29% 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. However, some variation exists among regions. Specifically, most parts of SWQ have yield outcomes ranked in the bottom 10% of all years, whereas most parts of CQ and SEQ 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, especially in those areas with late planted winter crops.

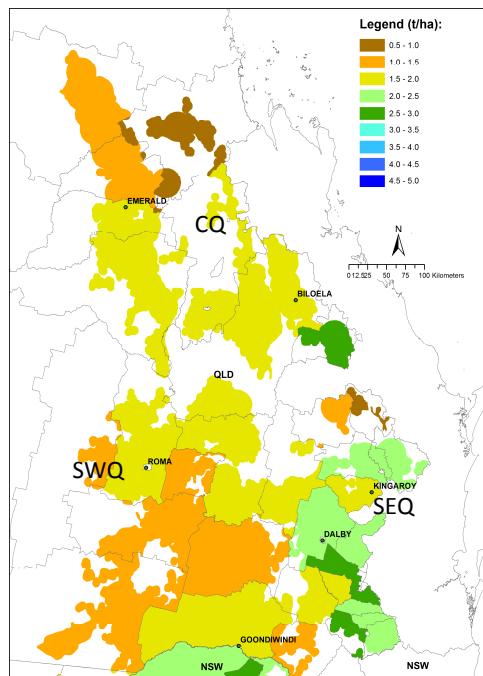
## GENERAL CONDITIONS

Rainfall recorded during August was below to very much below average across most of the state's cropping region. This combined with the above average maximum temperatures experienced during that period resulted in the further reduction of the current crop yield prediction across almost the entire winter cropping region of the state. Early planted crops have reached maturity, while late planted crops will need widespread above average rainfall to improve the current crop yield prospects in those regions.

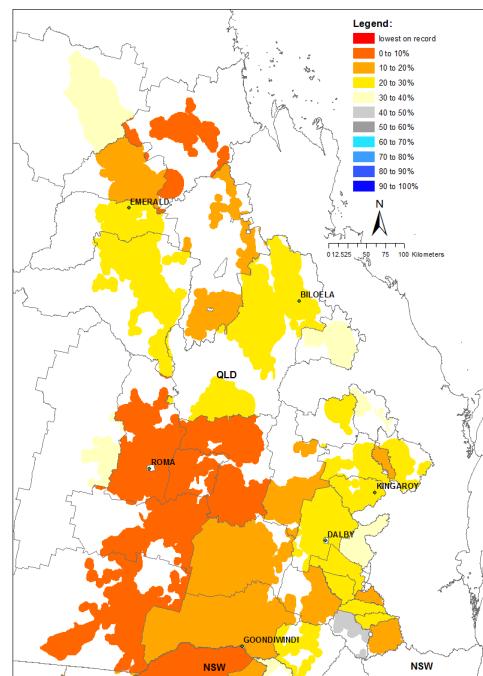
The recent pattern of the SOI, "consistently positive" at the end of August, indicates chances are slightly increased for above average rainfall in most parts of the state's cropping region over the next 3-months ([www.longpaddock.qld.gov.au](http://www.longpaddock.qld.gov.au)). However, any significant rainfall during the next month will have little to no impact on early planted crops since maturity has already been reached. A wet finish to the winter cropping season, however, might increase the risk of diseases and harvesting problems, especially for late sown crops. Note: this outlook is only applicable to a summer (short) fallow crop management scenario.

## 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 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 light grey to red have a reduced chance of exceeding the median yield, whereas areas coloured in dark grey to dark blue have an increased chance.



Map 1: Long-term median simulated shire yield using 2017 technology (115 years)

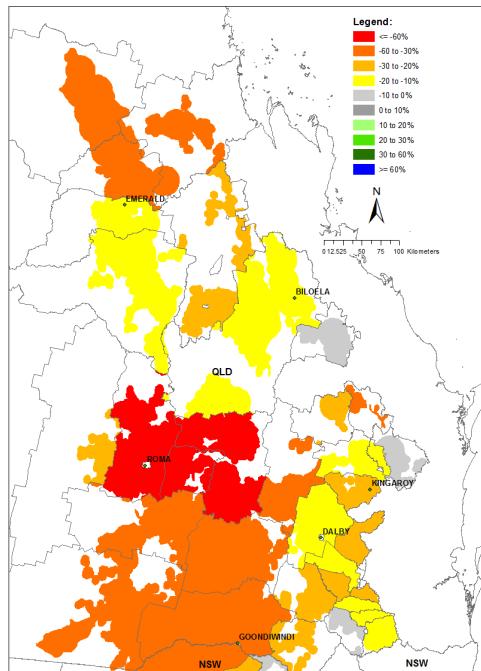


Map 2: Forecast median shire yield ranked relative to all years (%)

Maps 2 and 3 are derived by considering conditions up to the end of August and projecting forward based on rainfall conditions in years from the historical record with SOI phase similar to this year - "consistently positive" in July-August. 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 all of SWQ cropping region falling below the 10<sup>th</sup> percentile of all years (i.e. in the lowest yielding 10% of years). However, for most parts of CQ and SEQ the predicted crop yields ranked in the 20<sup>th</sup> – 40<sup>th</sup> percentile range relative to all years (Map 2).

Percentage departure of the forecast median yield from the long-term expectation is shown in Map 3. The impact pattern is similar to that of the predicted percentile with large negative deviations (i.e. worse than -30%) for almost the entire SWQ region. The exception is for most parts of CQ and SEQ, which have predicted yield outcomes below (-30% to -10%) the long-term median (Map 2). Note that this forecast does not take into account those areas that could not be planted due to a lack of sowing rainfall.



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

## POOR CROP CHANCE

With the sowing window now closed, almost all parts of the SEQ and SWQ are showing increased chances (> 20%) for wheat yield being similar or below 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

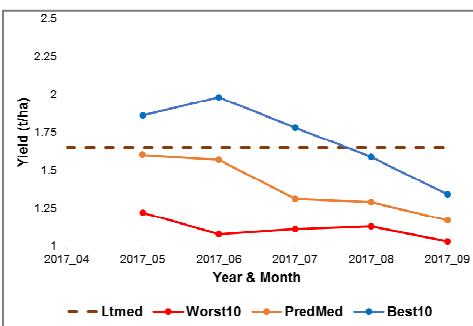
The current state wheat outlook shows a forecast median yield at the end of August this year of 1.17 t/ha, which is well below the long-term median of 1.65 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 1.03 t/ha or higher than 1.34 t/ha. The current forecast indicates a well 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 even 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	Median (50%)	DFY (%)	Percentile (%)	Lt Median
CQ	1.16	-24	23	1.53
SEQ	1.73	-18	20	2.13
SWQ	0.98	-48	8	1.52

DFY is the percentage departure of the forecast shire median yield from the long-term shire median wheat yield. Lt is the long-term.

Forecast medians have reduced further to very much below the long-term median expectations for all regions of the state. All regions have yield outcomes in the bottom 25<sup>th</sup> percentile when ranked relative to all years. More specifically, SWQ, SEQ and CQ have forecast medians of 0.98, 1.73 and 1.16 t/ha, respectively. The SOI phase of "consistently positive" at end of August indicates a slightly increased chance for above average rainfall, over the next 3-months in most of the state's winter cropping region. However, this will be too late for most of the early planted crops, especially in CQ where maturity has been reached. Widespread rainfall is needed to prevent even further deterioration in the current predicted yield outcomes across all regions.



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  $R^2 > 0.60$ .