

SEASONAL CROP OUTLOOK

Wheat – June 2018

SUMMARY

The current winter crop outlook for the state as a whole indicates a predicted median crop yield slightly below the long-term expectation (39th percentile ranking relative to all years). This incorporates current *soil water conditions* and the *seasonal rainfall outlook* based on the southern oscillation index. There is however large variation within the state's cropping region. Specifically, most parts of southern QLD and CQ have a reduced chance of this year's wheat crop being above the long-term median for that region. The remainder of the state's winter cropping region has equal chances (i.e. 50:50) to have a yield outcome above or below the long-term median expectation. This early in the season, widespread above average rainfall is needed across all parts of the state's cropping region during the next few months. This will induce good planting opportunities and improve current winter cropping conditions. 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.

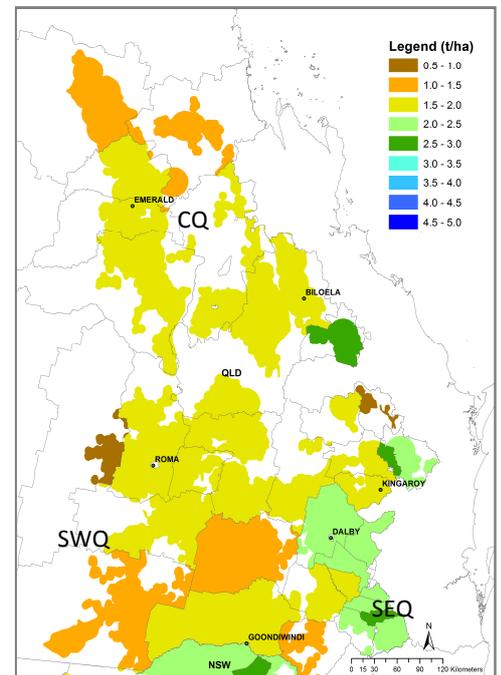
GENERAL CONDITIONS

This early in the season, few to no sowing opportunities occurred during April to May across most of the state's winter cropping region. Apart from some parts in southern CQ and northern SEQ, which received average rainfall, below to very much 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 below to very much below average for most parts of the state's cropping region. This resulted in poor replenishment of soil water levels in most of the state's winter cropping region. Specifically, soil moisture profile levels are around one-third (30-40%) of the potential for most of SEQ (deeper soils), while parts of SWQ are having soil moisture at close to half-full profiles (50%). In contrast, most of CQ (shallower soils) has replenishment of soil moisture levels to above 80% (Map 2).

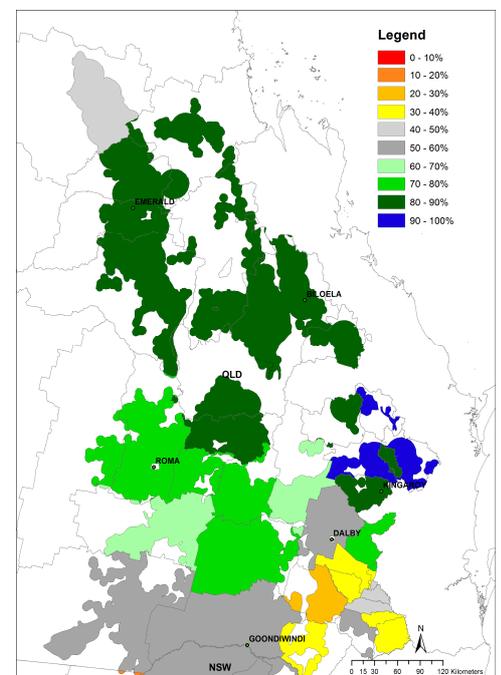
The recent pattern of the SOI, "consistently near zero" for the April-May period, indicates a slightly increased chance for above average rainfall in most parts of the state's southern winter cropping region over the next 3-months (www.longpaddock.qld.gov.au). This however, will change depending on the movement in the SOI as the season progresses over the next month. 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. Although atmospheric indicators of ENSO remains in a NEUTRAL phase at this early stage, progress of the climate indicators such as the SOI and sea surface temperature anomalies should be followed closely during the next few months (www.bom.gov.au/climate/enso).

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 118-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: Simulated long-term median shire yield derived from 1901 to 2017 using 2018 technology.



Map 2: Aggregated soil water recharge status (%) as at 1st June 2018. Summer fallow simulated from 1st of October 2017.

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 - "consistently near zero" 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 derived assuming only a summer (short) fallow period. The current state wheat outlook, at this 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 for most parts of northern SWQ and northern SEQ. In contrast, most parts of southern QLD and CQ have a much reduced chance (less than 20%) of exceeding the long-term shire yield expectation. With few to no sowing opportunities eventuated up to now in most of the state's winter cropping region, widespread above average rainfall during the next few months is needed to induce plantings and significantly improve the current wheat yield outlook for most of the CQ and southern QLD 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 2018 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 the southern SEQ and northern CQ are showing increased chances 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.

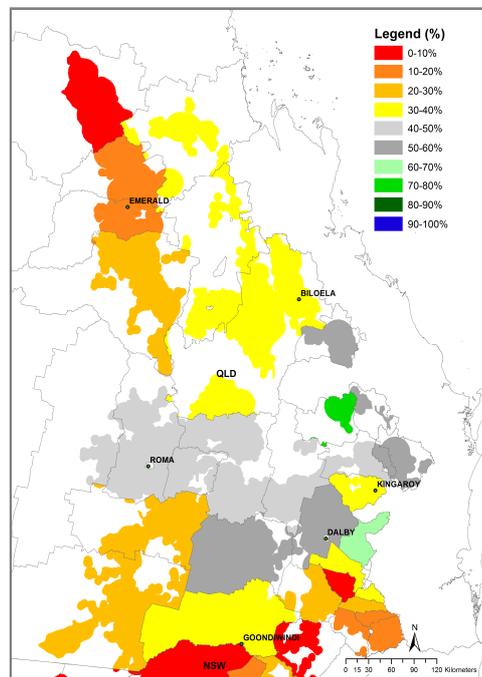
STATE OUTLOOK

At present, this early in the season, the current state wheat outlook shows a forecast median yield at the end of May of 1.71 t/ha, which is slightly below the long-term median of 1.86 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 1.51 t/ha or higher than 2.07 t/ha. However, keep in mind that it is 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.

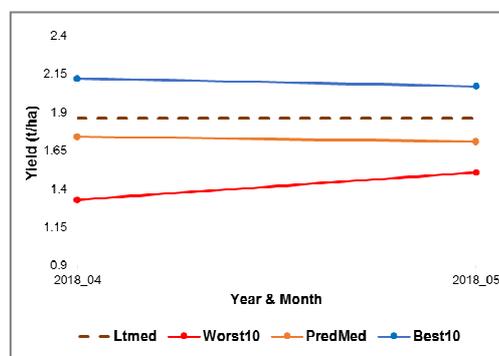
At regional level, Southwest Qld (SWQ), Southeast Qld (SEQ) and Central Qld (CQ) (see Map 1), the forecast yield (t/ha) ranges are as follows:

Region	Worst 10%	Median (50%)	Best 10%	LT-median
SWQ	1.25	1.54	1.94	1.62
SEQ	1.93	2.15	2.57	2.35
CQ	1.29	1.46	1.77	1.68

Forecast medians for all regions are close to or slightly below the long term median expectation for regional wheat yields. More specifically, deviation of the forecast median yield from the regional Lt-median expectation was -5%, -9% and -13% below the long-term median yield expectation for SWQ, SEQ and CQ, respectively. The SOI phase of "consistently near zero" at end of May indicates a slightly increased chance for above average rainfall in most parts of the state's cropping region rainfall over the next 3-months. 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.



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



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 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 $R^2 > 0.60$.