SEASONAL CROP OUTLOOK

Wheat – July 2018

SUMMARY

The current winter crop outlook for the state as a whole indicates a predicted crop yield of 1.61 t/ha, which is 13% below the long-term median yield expectation of the state. (26th percentile ranking relative to all years). This outlook incorporates current soil water conditions and the seasonal rainfall outlook based on the southern oscillation index. Although some relief rains were recorded in parts of southern CQ and northern SWQ as well as SEQ, during June, the crop outlook for the state as a whole remains below average. Specifically, almost all regions have yield outcomes ranked in the bottom 20% of all years, while some northern parts of SWQ and SEQ have yield outcomes ranked in the 20th to 40th 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.

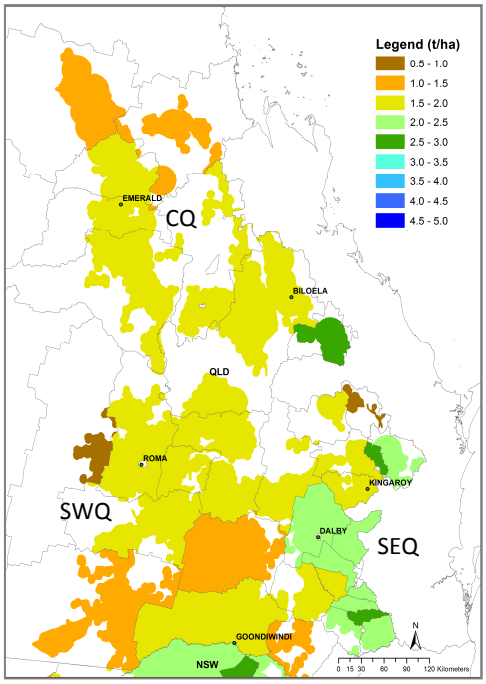
GENERAL CONDITIONS

Average to above average rainfall was recorded in parts of southern CQ and northern parts of SWQ and SEQ during June. Furthermore, below to very much below average rainfall was recorded during October to end of June (i.e. fallow and sowing period) across most parts of QLD's cropping region. Rainfall during June was not sufficient and recharge of the soil water levels across most of the state's winter cropping region was poor. Although some areas are showing higher levels of soil moisture, the top soils of most profiles are dry. Specifically, soil moisture profile levels remained close to 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). Finally, very few sowing opportunities occurred during the traditional planting window, which is now nearing its end.

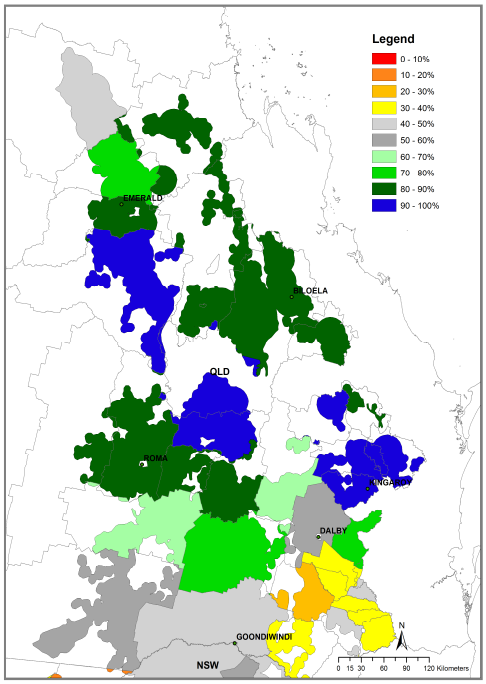
The recent pattern of the SOI, "rapidly falling" for the May-June period, indicates a chances similar to climatology for above average rainfall in most parts of the state's southern winter cropping region over the next 3-months (www.longpaddock.qld.gov.au). This however, will change depending on the 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). Forecast median shire yield ranked relative to all years (%) is shown in Map 3. Any areas coloured in yellow to red are ranked below to very much below the long-term median, while areas coloured in green to blue are ranked above to very much above the long-term median. And areas in grey are ranked similar to the long term median shire wheat yields relative to all years.



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 July 2018. Summer fallow simulated from 1st of October 2017.

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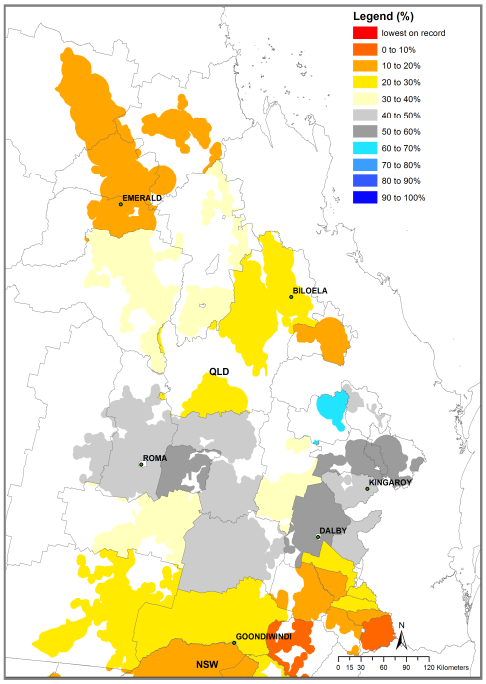
Map 3 is derived by considering conditions up to the end of June and projecting forward based on rainfall conditions in years from the historical record with SOI phase similar to this year - "rapidly falling" in May/June. The calculation of benchmark yields and outlook chances do not take into account effects of poor crop nutrition or damage due to pests, diseases, frosts or extreme events. This outlook is derived assuming 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, predicted yield outcomes for most of northern SWQ and northern SEQ are falling between the 20th to 40th percentiles relative to all years. While most of CQ and southern QLD 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 2018 season (see State Outlook section) as most 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.



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

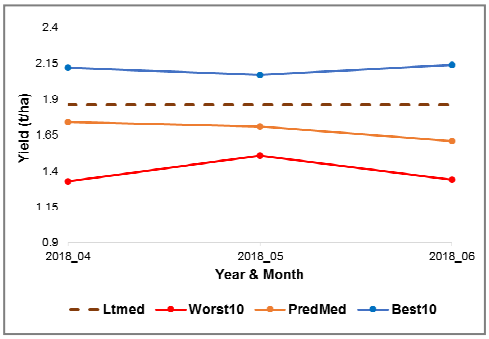
Poor Crop Chance

With the sowing window nearing its end in most regions, some parts of the southern SEQ and northern CQ are showing significantly increased chances for wheat yield being falling below the bottom 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 June of 1.61 t/ha, which is 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 1.34 t/ha or higher than 2.14 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 improve the outlook at shire and regional scales.



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

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	1.12	1.47	2.06	1.62
SEQ	1.64	2.16	2.57	2.35
CQ	1.26	1.37	1.69	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 long-term median expectation was -9%, -8% and -18% below the long-term median yield expectation for SWQ, SEQ and CQ, respectively. The SOI phase of " rapidly falling" at end of June indicates chances similar to climatology for receiving 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 month.

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 $R^2 > 0.60$.