SEASONAL CROP OUTLOOK
## Wheat – September 2018

SUMMARY

The current winter crop outlook for Queensland as a whole indicates a predicted crop yield of 1.34 t/ha, which is 28% below the long-term median yield expectation and within the lowest 5% relative to all years. This outlook incorporates current soil water conditions and the seasonal rainfall outlook based on the southern oscillation index (SOI). The crop outlook for the state has deteriorated further to very much below average. Specifically, all regions have yield outcomes ranked in the bottom 20% of all years, while some northern parts of CQ and southern SEQ have yield outcomes falling below the 10th percentile relative to all years. Widespread above average rainfall is needed during the next two months to prevent the current crop outlook from worsening further. The range of yield predictions has narrowed considerably, while the Bureau of Meteorology's (BOM) ENSO Outlook remains at El Niño WATCH status.
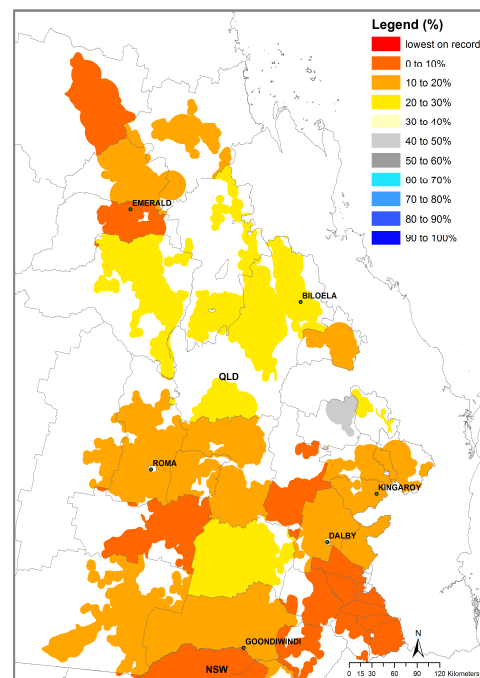
GENERAL CONDITIONS

Rainfall during August was below to very much below average for most parts of the state's winter cropping region. This combined with the protracted dry-spell up to now resulted in the further reduction of the current crop yield prediction across almost the entire winter cropping region of the state. Early planted crops are at or near maturity, while late planted crops will need wide spread above average rainfall to improve the current crop yield prospects. The recent pattern of the SOI, "rapidly falling" at the end of August, indicates slightly reduced chances of above average rainfall in most parts of the state's cropping region over the next 3-months (www.longpaddock.qld.gov.au). Global climate models remains suggestive of possible El Niño development during the next month or two (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 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, respectively. 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.
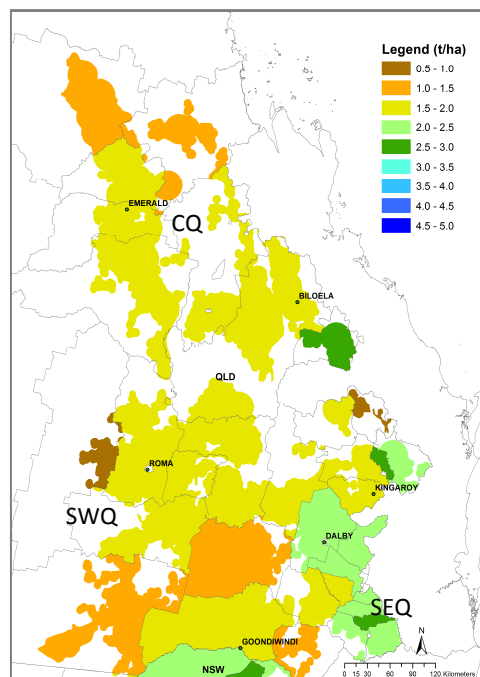
Map 1: Simulated long-term median shire yield derived from 1901 to 2017 using 2018 technology.

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

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Map 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 - "rapidly falling" 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 the entire state's cropping region having yield outcomes expected to be below average. Specifically, yield outcomes for most of southern QLD (SEQ and SWQ) are falling below the 20th percentile of all years (i.e. in the lowest yielding 20% of years). In addition, most parts of northern CQ and southern SEQ have been most impacted by the lack of winter rainfall and have predicted yield outcomes falling within the worst 10% of 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 less than -20% for most of southern QLD and CQ. The exception is for parts of SEQ, which has predicted yield outcomes below -30% of the long-term median. Note that this forecast only takes into account those areas that could be planted.

POOR CROP CHANCE

With most crops now approaching grain filling and maturity, most parts of southern QLD and northern CQ are showing a significantly increased chance for wheat yield being in 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, the current state wheat outlook shows a forecast median yield at the end of August of 1.34 t/ha, which is well 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 1.22 t/ha or higher than 1.54 t/ha. With the entire forecast distribution now falling below the long-term median expectation, the current forecast indicates a very much 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	Median (50%)	DFY (%)	Percentile (%)	Lt Median
CQ	1.29	-23	9	1.68
SEQ	1.59	-32	5	2.35
SWQ	1.13	-30	13	1.62

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 further reduced to very much below the long-term median expectations for all regions of the state. All regions have yield outcomes in the bottom 20% relative to all years. More specifically, SWQ, SEQ and CQ have forecast medians of 1.13, 1.59 and 1.29 t/ha, respectively. The SOI phase of "rapidly falling" at end of August indicates slightly reduced chance for above average rainfall, over the next 3-months in most of the state's winter cropping region. The range of possible outcomes have narrowed further for all regions as flowering and crop maturity are approached. Global climate models surveyed by BOM remains suggestive of possible El Niño development during the next two months. Widespread rainfall is needed to prevent further deterioration in the current predicted yield outcomes across all regions.
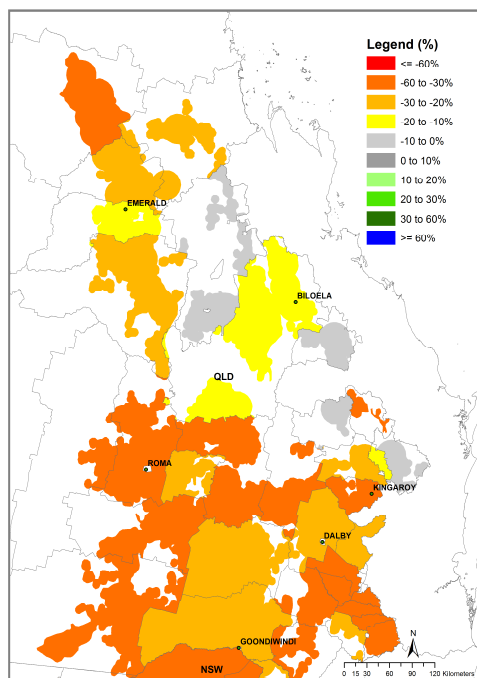
Map 3: Percentage departure of the forecast shire median yield from the long-term shire median wheat yield.
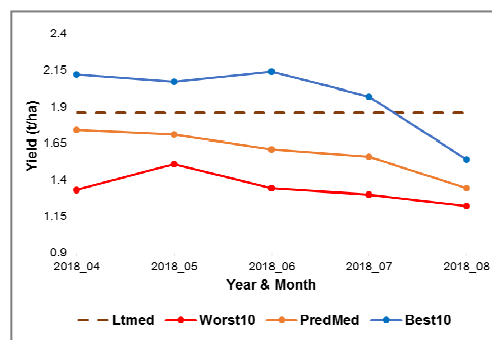
Graph A: State level yield forecast trajectories (10th, 50th and 90th percentiles).

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.