Seasonal Crop Outlook

September 2020

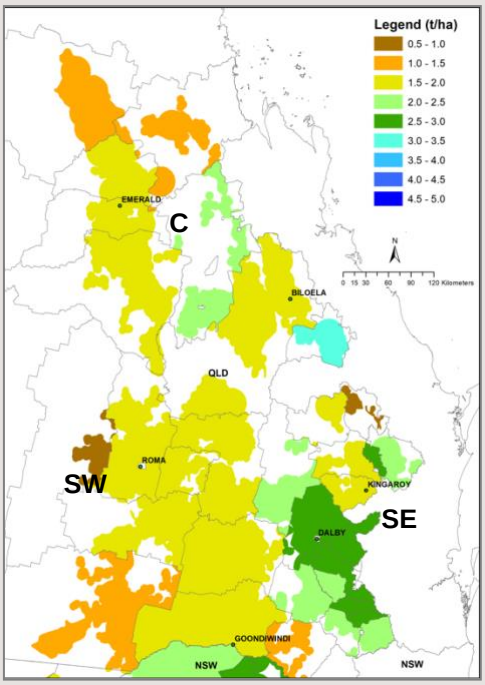
Summary

The current winter crop outlook for Queensland as a whole indicates a predicted crop yield of 1.65 t/ha, which is 13% below the long-term median yield expectation and is ranked close to the bottom 33rd % relative to all years. This outlook incorporates current soil water conditions and the seasonal rainfall outlook based on the southern oscillation index (SOI). Overall, the crop outlook for the state as a whole remains below average. Specifically, SWQ and SEQ have yield outcomes ranked in the bottom 30% of all years and yield departures of -21% and -10% from the long-term median, respectively. Conversely, CQ has yield outcomes close to the long-term expectation (40th percentile and -5% below the long-term median). With the Bureau's ENSO Outlook now in a La Niña ALERT state the likelihood for a wet finish has increased.

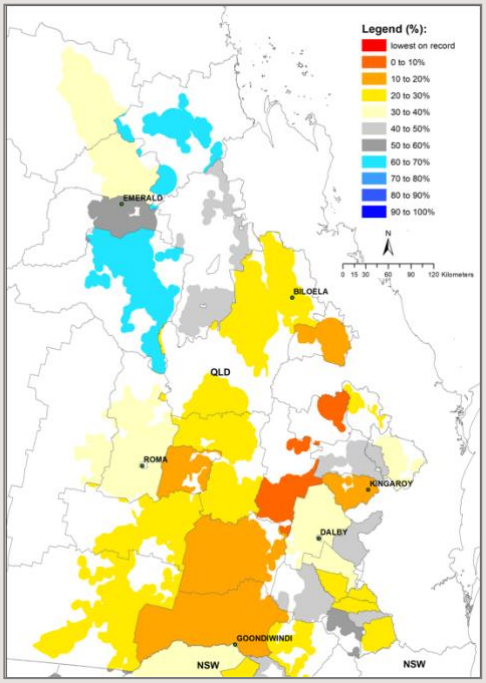
General Conditions

Rainfall during August was average for the entire winter cropping region of the state. Furthermore, rainfall during to April to August was below average across most of the cropping region and resulted in limited planting opportunities during the conclusion of the traditional sowing window period. Thus, prospects for an above average total production across most of the QLD winter cropping region remain poor. The exception is for some parts of CQ where the expected yield outcomes are similar to the long-term average. Wide spread above average rainfall is needed to improve the current crop outlook across the state's winter crop region.

The recent pattern of the SOI, "consistently positive" at the end of August, indicates an increased chance for above average rainfall in most other parts of the state's cropping region over the next 3-months (www.longpaddock.qld.gov.au). In addition, further cooling of the sea surface temperature (SST) has occurred during the August across the tropical Pacific Ocean and predictions from climate models are suggesting the developing of a La Niña event during Australian spring as highly likely (www.bom.gov.au/climate/enso). However, a wet finish to the winter cropping season might increase the risk of diseases and harvesting problems, especially for late sown crops.



Map 1: Simulated long-term median shire yield derived from the last 120-years with current technology.



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

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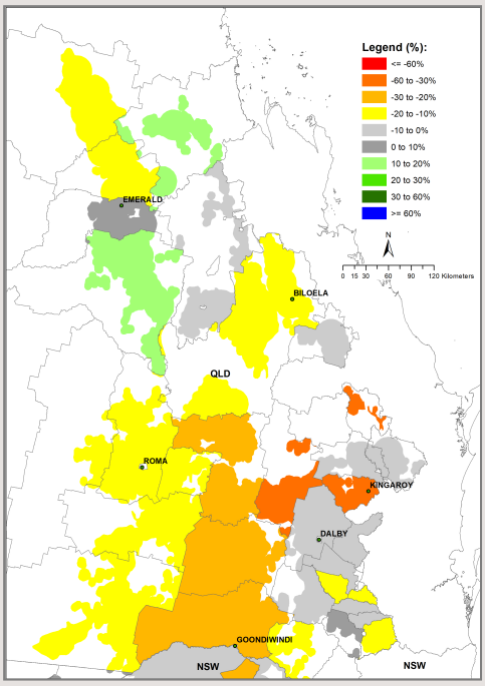
Outlook

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 120-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 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. Areas in grey are ranked similar to the long-term median shire wheat yields relative to all years.

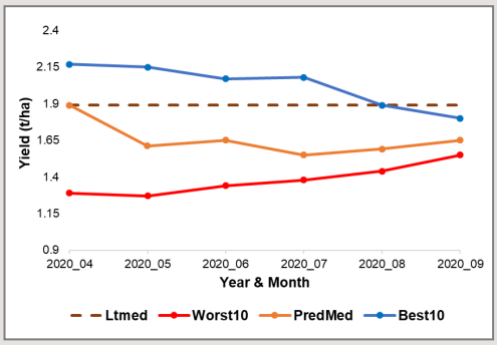
Map 2 and 3 are derived by considering conditions up to the end of August and projecting forward based on rainfall conditions in years from the historical record with SOI phase similar to this year - "consistently positive" in July/August. The calculation of benchmark yields and outlook chances do not 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 the entire state's cropping region having yield outcomes expected to be below average. Specifically, yield outcomes for most of SEQ and SWQ are falling below the 33rd percentile of all years. The exception is for some parts of CQ that are having predicted yield outcomes within the top 40% 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 yields with negative deviations of -20% to -30% for most of SWQ. However, some parts of SEQ are having yield outcomes similar to the long-term median. The exception is for some parts of CQ, which has predicted yield outcomes close to or above the long-term median for that region. Note that this forecast only takes into account those areas that could be planted.



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).

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Poor crop chance

With the sowing window now closed, some shires in SWQ are showing an increased chance 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, the current state wheat outlook shows a forecast median yield at the end of July of 1.65 t/ha, which is well below the long-term median of 1.89 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 1.55 t/ha or higher than 1.80 t/ha. With almost 90% of the forecast distribution now falling below the long-term median expectation, the current 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	Median (50%)	DFY (%)	Percentile (%)	LT-median
SWQ	1.31	-21%	19th	1.66
SEQ	1.95	-10%	33rd	2.39
CQ	1.62	-5%	40th	1.71

Forecast medians remain below the long-term median expectations and are 1.31 t/ha and 1.95 t/ha for SWQ and SEQ regions, respectively. Conversely, the predicted yield outcome for CQ of 1.62 t/ha is close to the long-term median for that region. The SOI phase of ”consistently positive” at end of August indicates an increased chance (60-70%) for above average rainfall, over the next 3-months. Most global climate models are predicting a La Niña development during the Australian spring. The most recent years in history with a similar SOI phase were 1998 and 2010. With all key climate indicators now consistent with a typical La Niña event, the likelihood of a wet finish to the current winter crop season has increased and might increase the risk of diseases and harvesting problems.

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 $R_2 > 0.60$.

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