SEASONAL CROP OUTLOOK

Wheat – October 2022

SUMMARY

With the winter crop nearing maturity and harvest, prospects continue to favour an above average winter season with a predicted state wheat yield of 2.52 t/ha. This is 31% above the long-term median yield expectation and falls within the top 10% of yield outcomes relative to all years. Specifically, SEQ, SWQ and CQ all have yield outcomes ranked in the top 25% of all years and yield departures of 14%, 42% and 39% above the long-term median, respectively. The range of yield predictions, at state level, has converged to a well above average winter crop season. All atmospheric and oceanic indicators of ENSO are indicating a well-established La Niña event. This suggests a high chance of a wet finish for the current winter cropping season. This might increase the risk of diseases and harvesting problems, especially for late sown crops. Thetotal area planted to winter crops was around 1.64M ha, which is slightly above the long-term median area planted over the last six-years (2016-2021) at a state level (QLD).

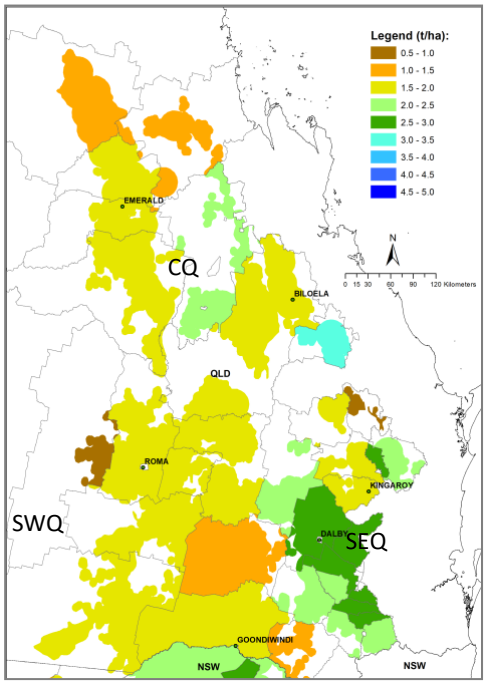
GENERAL CONDITIONS

Rainfall during September was very much above average throughout the state's winter cropping region. Furthermore, rainfall during April to September was also very much above average across most of the state's cropping region. As much of the season has now passed rainfall during October has less overall effect on final yield, except for a wet finish, which can affect grain quality and impede harvesting due to lodging.

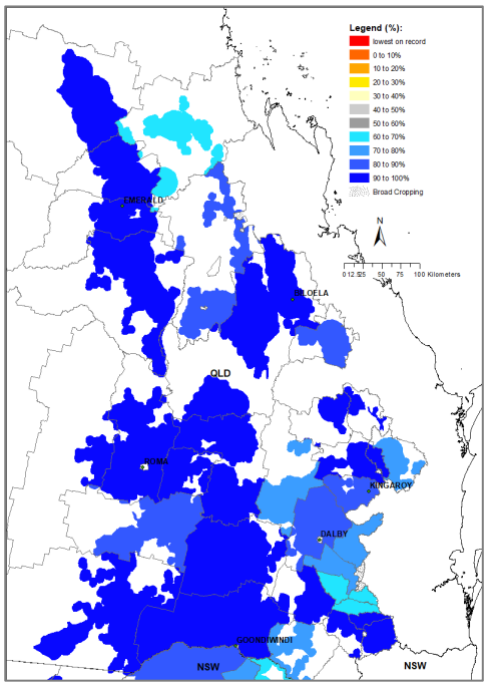
Prospects for projected in-crop rainfall based on the recent pattern of the SOI, i.e. "rapidly rising" for the August-September period, indicates an average to slightly increased chance for an above average rainfall in most parts of the state's winter cropping region over the next 3-months. Previous years, during the last 30-years, that had a similar SOI phase were 1983, 1989, 2001, 2005, 2009, 2011, 2012, 2016 (www.longpaddock.qld.gov.au). 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. At this stage, atmospheric indicators for ENSO are indicating a well-established La Niña event. Progress of the climate indicators such as the SOI and sea surface temperature anomalies can be followed here (www.bom.gov.au/climate/enso). During a La Niña event the likelihood of a wet finish to the current winter crop season has increased, which might increase the risk of diseases and harvesting problems.

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 121-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. 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 the last 121-years with current 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 September and projecting forward based on rainfall conditions in years from the historical record with SOI phase similar to this year - "rapidly rising" in Aug/Sept. The calculation of benchmark yields and outlook chances do not consider 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 shows chances remain highly favourable for a well above average yield (t/ha) crop across most of the state's cropping area (Map 2). However, observed areas sown to winter crop, from satellite imagery, were close to the long-term median area across most regions. Although, forecast yield outcomes (Map 2) had some slight variation between shires and regions, the entire state's cropping region has yield outcomes predicted to be above to very much above average. Specifically, yield outcomes for almost all regions now fall above the 25th percentile of all years.

The percentage departure of the forecast median yield from the long-term expectation is shown in Map 3. The spatial pattern is similar to that of the predicted percentile yields with positive deviations of between 10% to 20% for most of SEQ, while the remainder of the state's cropping regions have positive deviations of between 30% to 60%. Note that this forecast only takes into account those areas that could be planted and does not reflect likely total production.

Winter cropping

At present, likely total winter crop area sown relative to all available potential land area is around 4.7M and 1.64M hectares across the entire NEAUS and QLD winter cropping regions, respectively. This analysis relates to winter crop areas assessed at start of October. This is slightly above (12% & 13%) the total long-term median area observed (October) for winter crops from 2016-2021 (October) for NEAUS and QLD cropping region, respectively, indicating some late areas sown to winter cropping in the southern parts. The exception was in CQ, which had an increase in winter crop area (43%). Areas for winter crops were derived by utilising high-resolution satellite imagery (return period of 5-days) and mathematical algorithms applied to current land use cropping patterns (source: CropVision ARC LP).

State Outlook

At present, the current state (QLD) wheat outlook shows a forecast median yield at the start of September of 2.52 t/ha, which is very much above the long-term median yield of 1.93 t/ha (Graph A). The entire forecast distribution indicates a well-above-average yielding crop for the entire state. 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	2.39	42	99	1.68
SEQ	2.77	14	93	2.44
CQ	2.43	39	97	1.75

DFY is the percentage departure of the forecast shire median yield from the long-term shire median wheat yield. LT-median is the simulated long-term median yield. Percentiles are calculated for forecast median yield relative to all years.

All regions have forecast medians well above the long-term median expectations. Expected medians are 2.39 t/ha, 2.77 t/ha and 2.43 t/ha for SWQ, SEQ and CQ, respectively. The SOI phase is in a "rapidly rising" phase at end of September and reflects an average to slighty increased chance for above average rainfall, over the next 3-months in most of QLD.

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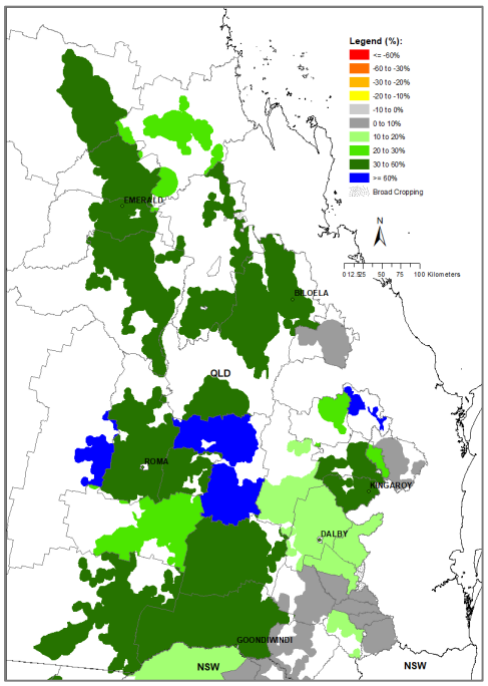
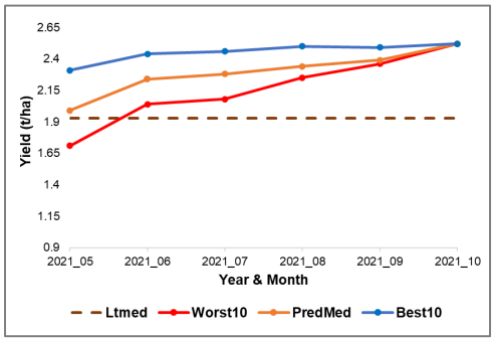


Map 3: Percentage departure of the current forecast median shire yield from the long-term shire median



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 1 October the year before sowing 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 $R^2 > 0.60$.