SEASONAL CROP OUTLOOK

Wheat – June 2017

SUMMARY

At this early stage in the winter crop season, chances for an above average yielding crop are similar to climatology (50:50) for the 2017 wheat crop across most of Queensland. However, a large variation in shire yields exists within the state's cropping region. This forecast was derived from integrating starting soil water conditions and the seasonal rainfall outlook based on the southern oscillation index. Specifically, most parts of central QLD's cropping region have an increased chance of an above average wheat yield. In contrast, most parts of south-western QLD have a reduced chance. The remainder of the state including parts of SEQ have chances close to 50:50 for an above average wheat yield this winter cropping season. Widespread above average rainfall is needed during the next few months to 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. Seasonal rainfall projections using historical analogue years based on SOI phases become more skilful for much of Queensland towards the end of July and it is recommended to follow the development of the SOI during the next couple of months. Although most international climate models are predicting sea surface temperatures in the tropical Pacific Ocean to contunue to warm over the next few months, some indicators are suggesting the likelihood of an El Niño event developing later this season to have stalled for now.

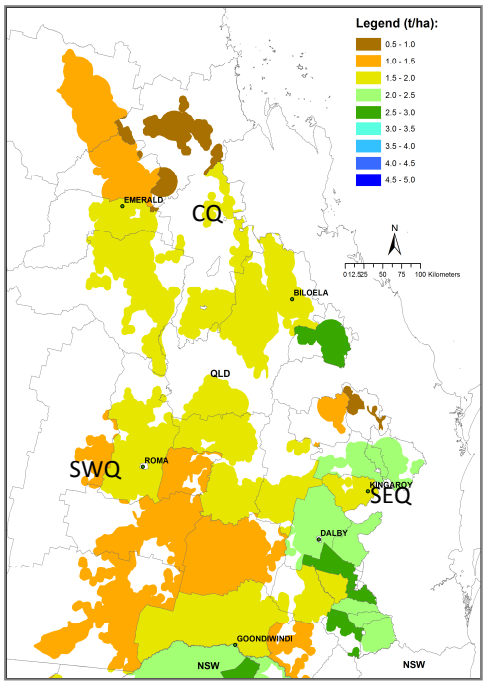
GENERAL CONDITIONS

Rainfall recorded during May was average to below average in most parts of southern QLD, while average rainfall was recorded in most of CQ. In addition, rainfall during the previous six months (December to May) was highly variable across the state's cropping region. More specifically, most parts of southern QLD received average to below average rainfall, which resulted in avaliable soil water levels recharged to around half (50%) that of the potential available water content (PAWC). Conversely, most parts of CQ had replenishment of soil moisture levels to above 75%. However, parts of Far South West QLD had soil moisture levels recharged to only one-quarter (20-30%) of the PAWC for that region (Map 2).

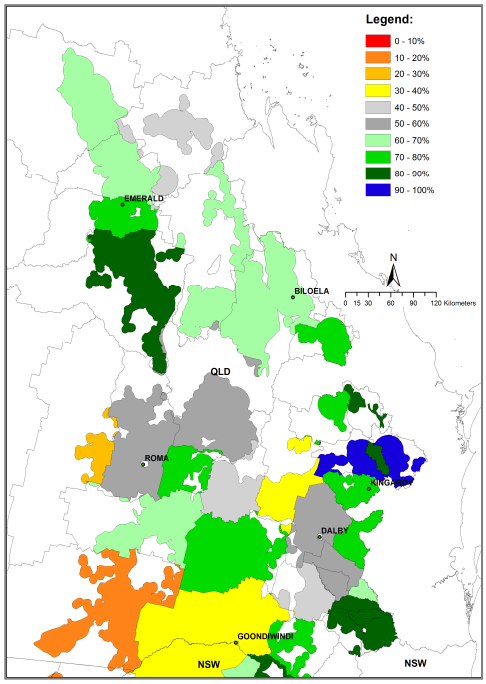
The recent pattern of the SOI, "rapidly rising" for the April-May period, indicates a slightly increased chance for above average rainfall in most parts of the southern QLD, while the remainder of the state's cropping region has a chance similar to climatology for above average rainfall over the next 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 firmly NEUTRAL, progress of the climate indicators such as the SOI should be followed closely during the next few months, particularly as the Bureau's ENSO Tracker remains at an El Niño WATCH status (www.bom.gov.au).

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 115-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: Long-term median simulated shire yield using 2017 technology (115 years)



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

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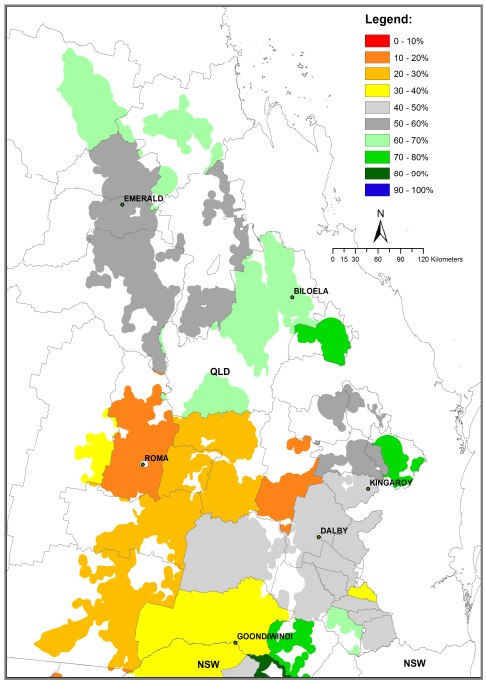
Map 3 is derived by considering conditions up to the end of May and projecting forward based on rainfall conditions in years from the historical record with SOI phase similar to this year - "rapidly rising" in April/May. The calculation of benchmark yields and outlook chances do not take into account 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 very early stage in the season, varies across most of the state's cropping area. Specifically, chances of exceeding the long-term median yield are above average for most parts of CQ. In contrast, most parts of SWQ specifically the Maranoa and Far South West of QLD have below average chances (less than 30%) of exceeding the long-term shire yield expectation. The remainder of QLD's cropping region, specifically SEQ, has slightly below average chances of exceeding the long-term shire yield expectation. 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 southern parts 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 2017 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.



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

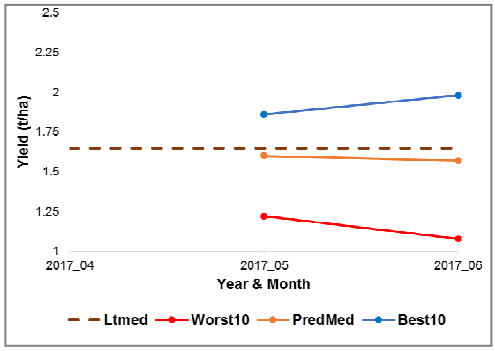
Poor Crop Chance

At present, this early in the growing season, some parts of the Maranoa and Western Downs in southern QLD are showing increased chances (20% to 30%) 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

The current state wheat outlook shows a forecast median yield at the end of May this year of 1.57 t/ha, which is similar to the long-term median of 1.65 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 1.08 t/ha or higher than 1.98 t/ha. At present - this early in the season - the forecast indicates a close to average-yielding crop for the state as a whole. However, keep in mind that it is very 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.



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	0.82	1.15	1.76	1.53
SEQ	1.56	2.06	2.44	2.13
CQ	1.08	1.65	1.96	1.52

The forecast median of 1.15 t/ha for SWQ is below the long-term median expectation for that region. Conversely, the predicted yield outcomes for CQ of 1.65 t/ha and SEQ of 1.56 t/ha are close to the long-term medians for those regions. The SOI phase of "rapidly rising" at end of May indicates a slightly increased chance for above average rainfall in most parts of southern QLD, while the remainder of the state's cropping region has a chance similar to climatology (50:50) for above average 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, specifically with warmer-than-average sea surface temperatures likely to continue to slowly develop later this season in the equatorial Pacific (www.bom.gov.au).

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 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 1975 – 2000, 2005 & 2010 (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.