

# SEASONAL CROP OUTLOOK

## Sorghum – December 2015

### SUMMARY

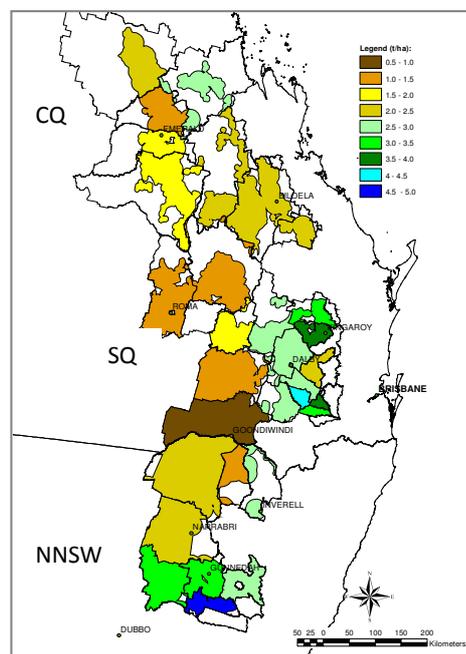
Current soil water conditions and seasonal rainfall outlook indicate an average yielding sorghum crop for the 2015/16 summer growing season. There remains, however, variation in the outlook among local areas. Overall, most of QLD is showing a slightly below average yield crop, while NNSW is showing an average crop yield expectation. **It should be noted**, this is still early in the growing season and the range of likely sorghum yield outcomes remains wide. Widespread rainfall is needed, during the next couple of months, to induce good summer plantings and improve the current crop outlook across all areas of the north-eastern Australian (NEAUS) summer cropping region. This crop outlook is based on a crop-free (fallow) practice through the winter season and therefore areas with longer fallow practices are likely to have better yield prospects for the coming season.

### GENERAL CONDITIONS

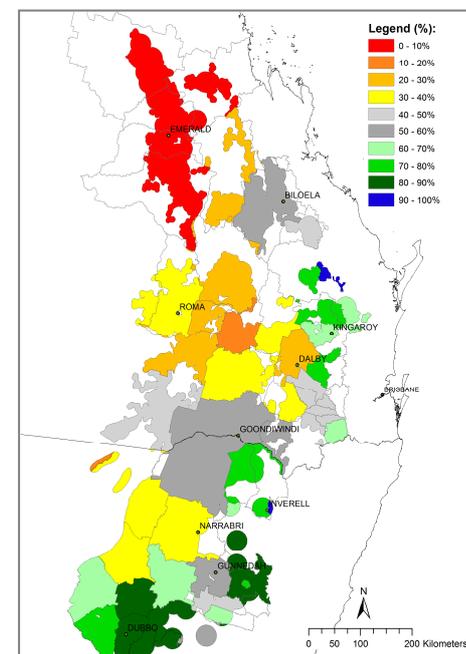
Apart from parts of the central Highlands in CQ, soil water profiles improved in most parts of the summer cropping region. Rainfall during November was average to above average for most parts of SEQ (including eastern Downs & Central Burnett) as well as NNSW. The remainder of the NEAUS cropping region received average to below average rainfall during November. Rainfall during the previous three months (Sept – Nov) had a similar spatial pattern as that of November, while fallow rainfall (March to November) showed average to above average rainfall for NNSW and SEQ and average rainfall for SWQ. The exception is most parts of central QLD, which had below average rainfall for that period. This resulted in estimated stored soil moisture levels (simulated through winter fallow using APSIM) to be variable across the summer cropping region. Almost the entire SEQ and southern parts of NNSW are showing soil water recharge levels (~ 70% or above), while most areas of northern NNSW and SWQ recharged to 50% of available soil moisture profile. The exception is parts of the central Highlands, which have extremely low (< 30%) soil moisture levels (Map 2). Sorghum crop plantings continued in most parts of NNSW and SEQ, which had close to or full sub-soil moisture levels (mainly longer fallow). Widespread rainfall is needed over the next couple of months to induce further planting opportunities across the entire summer cropping region. The recent pattern of the SOI i.e. “rapidly rising” for the Oct-Nov period, indicates slightly reduced chance of receiving above average rainfall across most of the NEAUS summer grains cropping region over the next 3-months ([www.longpaddock.qld.gov.au](http://www.longpaddock.qld.gov.au)). Although, the Bureau of Meteorology’s ENSO Tracker remains in an El Niño mode, most climate models are predicting it to peak early 2016 (<http://www.bom.gov.au/climate/enso/tracker/>). The impact of past moderately strong El Niño events on summer (Dec-Feb) rainfall is less severe than that of rainfall during the preceding winter period (<http://www.bom.gov.au/climate/enso/ninocomp.shtml>).

### OUTLOOK

This regional sorghum crop outlook is based on the assumption of cropping after winter fallow. The benchmark for this outlook is the simulated long-term median shire sorghum yield within the broad NEAUS cropping region (Map 1). The median yield is based on predicted performance over the past 111-years using an agro-climatic model for sorghum with long-term rainfall records (see descriptive note for more details). Probability of exceeding the long-term shire median yield for this year is shown in Map 3. Any areas coloured in light grey, yellow and red have a poor to very poor chance of having crops above the long-term median yield, whereas areas coloured in dark grey, green and blue have good to very good chances of producing higher yielding crops. Map 3 is derived by considering conditions up to date (end of November) and projecting forward based on rainfall conditions in years with SOI phase similar to this year - “rapidly rising” in the October to November period. 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 (e.g. heat waves).



Map 11: Long-term median simulated shire sorghum yield (111 years)



Map 22: Aggregated soil water recharge status (%) as at 2<sup>nd</sup> December 2015. Winter fallow simulated from 1st of April 2015.

The poor recharge of the starting soil moisture profile levels in combination with slightly reduced chance of average rainfall over the next 3-months, resulted in slightly below average chances (30-50%) of exceeding the long-term median yield for most areas in NNSW and QLD cropping region, while some parts of northern SEQ are showing yield outcomes slightly above to the long-term expectation (60% to 70%).

*It should be noted*, that at this early stage of the season, the range of likely yield outcomes for the 2015/2016 season (see Regional Outlook section) is still wide as much of the growing season remains in the projected forecast. Updating each month, as the season progresses, causes the range of yield outcomes to narrow towards the final realised yield at the end of the season.

## POOR CROP CHANCE

At present, this early in the growing season, chances for this season's sorghum crop to fall below the worst 10% (crop yield) of all years remains low with some parts of the southern NNSW and central QLD showing a slightly increased chance of falling in that category (i.e. below the worst 10% of all years, data not shown).

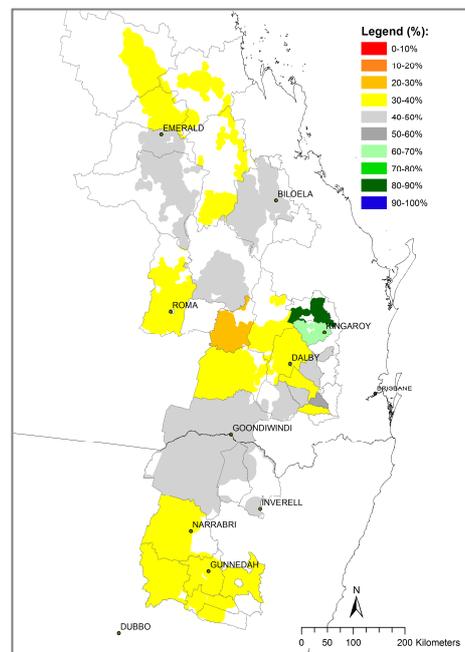
It should be noted that these values are calculated as broad indicators for shire scale. They do not apply to farm level.

## STATE OUTLOOK

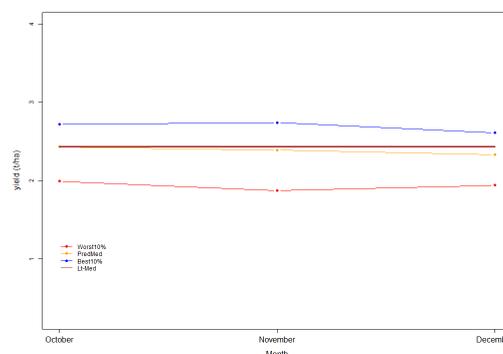
The current regional outlook shows the forecast median yield for the entire NE AUS' sorghum-cropping region at the end of October as 2.36 t/ha, which is slightly below the long-term median of 2.43 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 1.97 t/ha, or higher than 2.63 t/ha. At local regional level, Central Qld (CQ) and Southern Qld (SQ) and northern NSW (NNSW) (see Map 1), the forecast yield (t/ha) ranges are as follows:

Region	Worst 10%	Median (50%)	Best (%)	Lt median
CQ	1.34	1.96	2.23	2.08
SQ	1.97	2.31	2.76	2.50
QLD	1.76	2.12	2.46	2.24
NNSW	2.61	3.10	3.41	3.10

At this early stage of the season, all regions are showing yield expectations close to or slightly below the long-term regional sorghum yield expectation. However, a wide range of possible outcomes still exists, which will narrow as the season progresses and the actual climate experienced is incorporated in the analysis. The current SOI phase ("rapidly rising" in Oct/Nov) indicates slightly reduced chances to receive above average rainfall during the next three months across most of NEAUS summer cropping region. Widespread above average rainfall is needed over the next couple of months to induce good planting opportunities across the entire region.



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



Graph A: NE AUS sorghum yield forecast trajectories (10<sup>th</sup>, 50<sup>th</sup> and 90<sup>th</sup> percentiles).

### DESCRIPTIVE NOTE:

The seasonal sorghum outlook is based on the integration of (i) a simple agro-climatic sorghum stress index model (i.e. Bare fallow routine - Ritchie, 1972; Sorghum 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 sorghum model is run from 1 April the year before harvest in order to account for the influence of the winter fallow on starting soil moisture conditions. The model shire input parameters (i.e. plant available water content, planting rain & stress index period) have been selected based on the best fit when calibrated against actual shire sorghum yields from the Australian Bureau of Statistics (ABS) for the period 1983 - 1997. Cross-validated correlations ranged from 0.6 to 0.9 within the main sorghum producing shires of NE Australia (31 in total). (Potgieter et al., 2005)