

# SEASONAL CROP OUTLOOK

## Sorghum – February 2017

### SUMMARY

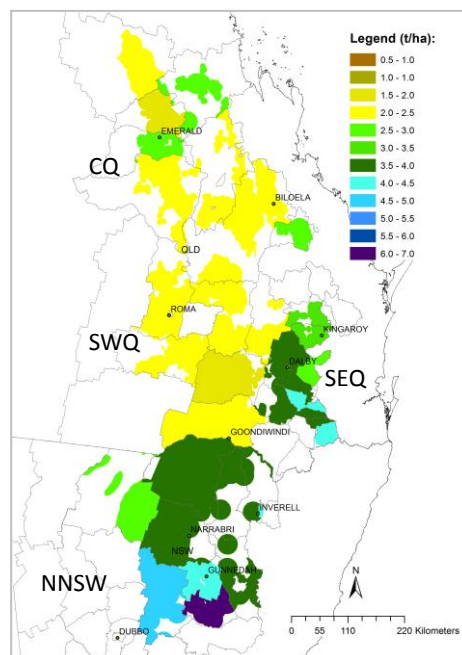
With the summer cropping season nearing completion the chances for an above average yielding sorghum crop for the 2016/17 summer growing season in north-eastern Australia (NEAUS) remains high across most parts of the cropping region. However, some variation in the outlook among local regions exists. Although very few plantings have occurred in CQ to date, a close to or below average crop yield expectation is forecast for those areas that did manage to plant on sufficient soil moisture profiles. Most areas in SEQ, excluding parts of the northern Darling Downs that have a below average crop expectation, have predicted yield outcomes close to the long-term expectation. The exception is for areas in SWQ and NNSW that have sorghum yield outcomes slightly above the long-term median. With the recent extremely high temperatures recorded in most of the summer cropping region it is anticipated that the impact will result in a reduction in yield and downgrading in grain quality of sorghum crops across most regions. With the sowing window now closed, except for some parts of CQ, further rainfall will be needed during the next couple of weeks to improve and ensure the current crop outlook is realised across all areas of the 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

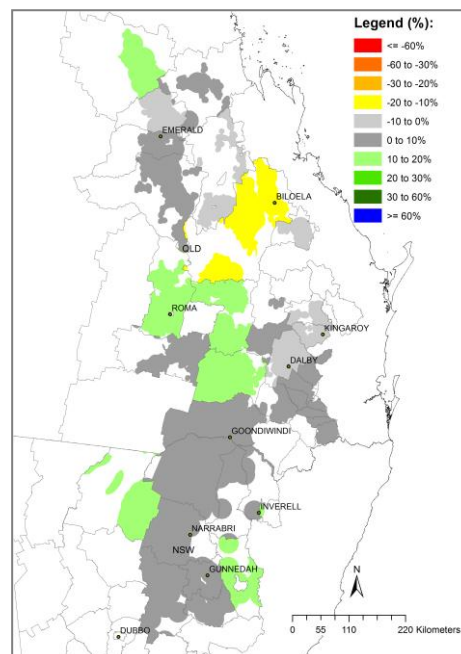
Rainfall during January highly variable and close to or below average in most of NEAUS cropping region. While the soil moisture profiles were close to  $\frac{3}{4}$  full across most of SWQ and NNSW, the rainfall recorded during November to end of January was below to very much below average across most of the NEAUS cropping region. This resulted in a lower than expected recharge of soil water profiles for most areas (data not shown). The recent extreme temperatures recorded in most of the cropping region will have a negative impact on final crop yields and is not accounted for in this outlook. In addition, long fallow soils have higher soil water recharge levels and are not discussed in this report. The recent pattern of the SOI i.e. “consistently near zero” for the Dec-Jan period, indicates chances similar to climatology (i.e. 50:50) of receiving above average rainfall for most of the summer grains cropping region over the next 3-months ([www.longpaddock.qld.gov.au](http://www.longpaddock.qld.gov.au)).

### 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 115-years using an agro-climatic model for sorghum with long-term rainfall records (see descriptive note for more details). The percentage departure of the forecast median for this season from the long-term median shire sorghum yield is given in Map 2. Map 3 shows the current forecast shire median yield ranked relative to all years. Any areas coloured in light grey, yellow or red have a poor to very poor chance of having crops above the long-term median yield, whereas areas coloured in dark grey, green or blue have good to very good chances of producing higher yielding crops. Map 2 & 3 are derived by considering conditions up to date (end of January) and projecting forward based on rainfall conditions in years with SOI phase similar to this year - “consistently near zero” in the December to January 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 1: Long-term median simulated shire sorghum yield (115 years)



Map 2: Percentage departure of the current forecast median shire yield from the long-term shire median yield.

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Yield outcomes vary geographically across most of the NEAUS summer cropping region. Map 2 shows that for this season, most areas in NNSW and South West QLD are having forecast yield expectations slightly above the long-term median (10% – 20%), while most areas in CQ and SEQ have forecast yields close to or below the long-term median expectation for that region. Specifically, the Biloela, Emerald and Dalby regions are showing reduced yield outcomes below the long-term median for that region. Furthermore, almost all yield outcomes in NNSW and South West QLD are in the 60% to 80% percentile compared to all yield expectations over the last 115 years. In contrast, most of Central QLD (i.e. Emerald & Banana shires) and parts of northern Darling Downs (i.e. Wambo shire) are showing yield outcomes in the 20<sup>th</sup> to 40<sup>th</sup> percentile range (Map 3). It should be noted that extreme heat waves will have a negative impact on final crop yield as well as grain quality as is the case during this season. *Note: Final summer crop yield is usually more affected by in-crop rainfall and temperatures (during crop growth) than by the soil moisture at sowing although it remains important in final crop yield expectations.*

## 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 are slightly increased in parts of CQ, while the remainder of the cropping region is showing chances close to the long-term expectation (i.e. 10%; Data not shown).

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

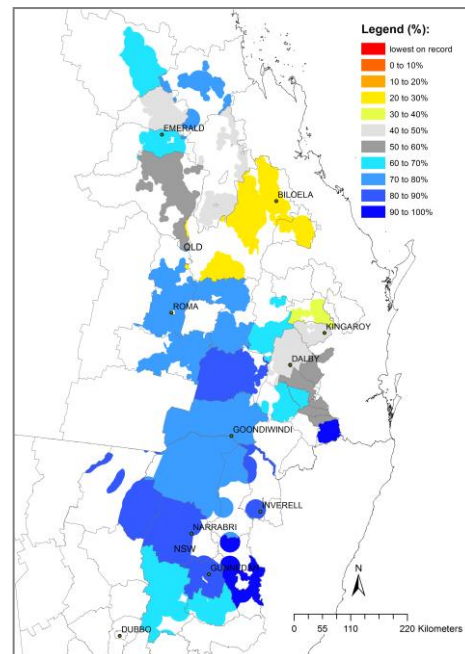
## STATE OUTLOOK

The current regional outlook shows the forecast median yield for the entire NEAUS sorghum-cropping region at the end of January as 3.03 t/ha, which is slightly above the long-term median of 2.84 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 2.82t/ha, or higher than 3.17 t/ha. At local regional level, Queensland (QLD), central Qld (CQ), south west QLD (SWQ), south east Qld (SEQ) and northern NSW (NNSW) (Map 1), the forecast yield (t/ha) ranges are as follow:

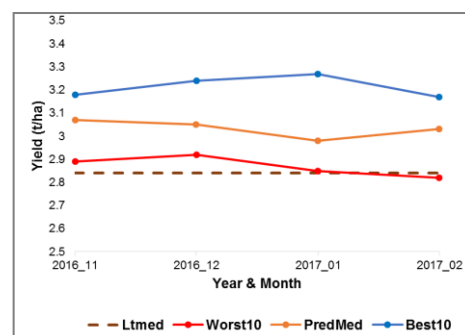
Region	Median (50%)	DFY (%)	Percentile (%)	Lt median
CQ	2.13	2	53	2.17
SEQ	3.58	2	57	3.47
SWQ	2.16	9	77	2.07
QLD	2.49	4	67	2.50
NNSW	3.65	8	85	3.41

*DFY is the percentage departure of the forecast shire median yield from the long-term shire median wheat yield.*

With the summer cropping season approaching harvest CQ and SEQ regions have yield expectations close to the long-term regional sorghum yield expectation (i.e. 53 & 57<sup>th</sup> percentiles, respectively), while SWQ and NNSW have predicted medians in the top 30<sup>th</sup> percentile ranked relative to all years. The current SOI phase (“consistently near zero”) indicates chances to receive above average rainfall are close to climatology (50:50) in most parts of NEAUS summer cropping region over the next 3-months. Widespread average rainfall is needed over the next couple of months to ensure good crop growth conditions especially around flowering for late planted crops. The impact of extreme weather events including protracted high temperatures as occurred during early February is not accounted for by this approach. Finally, this report only discusses the likely sorghum yield if a crop was planted and is therefore not a total production estimate.



Map 3: Forecast median shire yield ranked relative to all years (%)



Graph A: NE AUS sorghum yield forecast trajectories (Ltmed: long-term median, Worst10: 10<sup>th</sup>, PredMed: 50<sup>th</sup> and Best10: 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) census years for the period 1983 – 2000, 2006, 2011. Oz-Sorghum MII showed cross-validated correlations (r) ranging from 0.6 to 0.92 within the main sorghum producing shires of NE Australia (35 in total). These shires contributes to 96% of total average production of all sorghum producing shires. (For more detail see Potgieter et. al., 2005)