

SEASONAL CROP OUTLOOK

Sorghum: March 2019

SUMMARY

This late in the 2018/19 sorghum cropping season, predicted average crop yield for north-eastern Australia's (NEAUS) summer cropping region has converged to 2.38 t/ha, which is close to the lowest on record (1st percentile) over the long-term. Very little variation exists across almost the entire NEAUS region with all regions having a forecast median yield falling in the bottom 5th percentile relative to all years. The recent very much below average rainfall recorded during February in the entire summer cropping region has further diminished crop yield prospects to very much below or lowest on record for some shires for the 2018/19 sorghum cropping season. The exception is for parts of southern NNSW, which have a close to average crop yield expectation. This crop outlook is based on a crop-free (short fallow) practice through the winter season and therefore areas with longer fallow practices are likely to have better yield prospects.

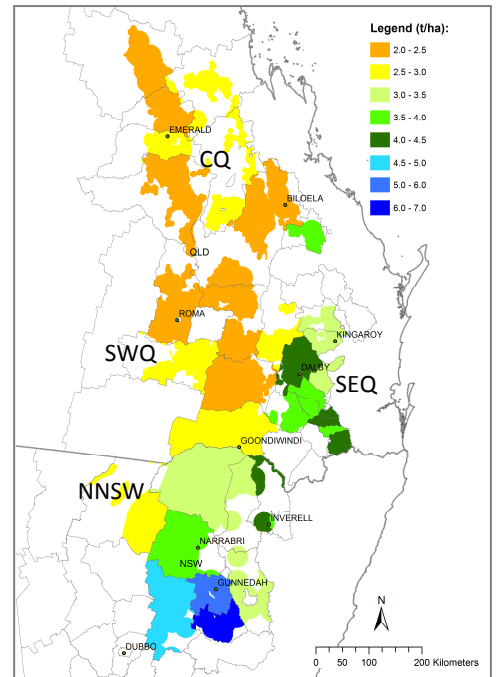
GENERAL CONDITIONS

Very much below average rainfall to the lowest on record was recorded during February for most parts of the summer cropping region. Rainfall during the previous six months had a similar pattern across the summer cropping region of Australia. Furthermore, the warmer than average conditions experienced across most of the region during the previous three months have contributed further to the current lower yield expectations. Any rainfall recorded in early March will be too late for improving the yield of early planted crops but will likely improve the crop yield outcomes for those late planted areas mainly in CQ. However, later plantings usually result in a reduction in final crop yields. Harvesting has started on early planted

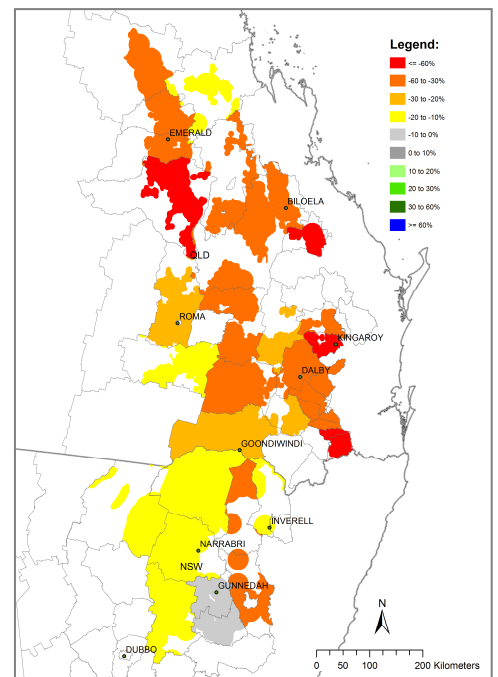
sorghum crops in NSW and southern QLD. The recent pattern of the SOI (i.e. "rapidly falling") at the end of February, indicates chances similar to climatology (i.e. 50:50) of receiving above average rainfall for most parts of the NEAUS summer cropping region during the next 3-months (www.longpaddock.qld.gov.au).

OUTLOOK

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 118-years using an agro-climatic model for sorghum with long-term rainfall records (see descriptive note for more details). The percentage departure (deviation) of the forecast median (DFY) 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 likelihood of having crops above the long-term median yield, whereas areas coloured in dark grey, green or blue have moderate to high chances of producing higher yielding crops. Maps 2 & 3 are derived by considering conditions up to date and projecting forward based on rainfall conditions in years with SOI phase similar to this year i.e. "rapidly falling" at the end of February 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: Simulated long-term median shire yield derived from 1901 to 2018 using 2018 technology.



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

Yield outcomes varied slightly across most of the NEAUS summer cropping region (Map 2). Most areas in QLD's cropping region have forecast yield expectations below (-20% to -30%) to very much below (-30% to -60%) the long-term median, while most areas in northern NSW (NNSW) have forecast yield deviations below (-10% to -20%) the long-term median expectation. The exception is for some parts of southern NNSW that have a close to average yield deviation (0 - 10%). Furthermore, almost all yield outcomes in NEAUS' cropping region are extremely low and fall below the 10th percentile compared to all seasons over the last 118 years (Map 3). *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 this stage in the growing season, most parts of NEAUS have a highly increased chance for this season's sorghum crop to be among the worst 10% (crop yield) of all years (data not shown). It should be noted that these values are calculated as broad indicators for shire scale and do not apply to farm level.

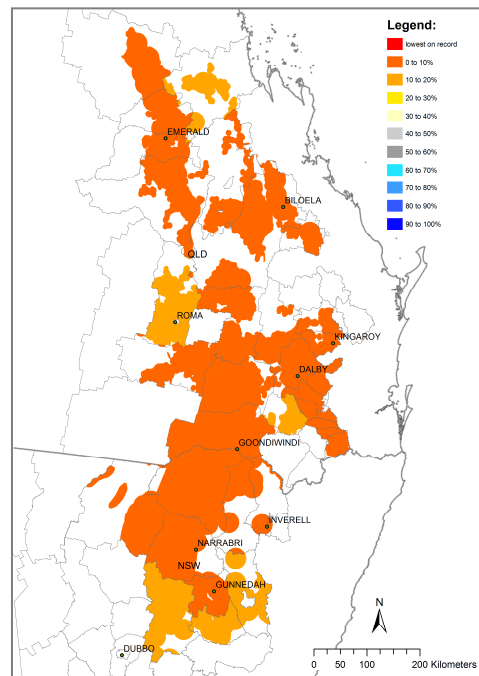
STATE OUTLOOK

The current regional outlook shows the forecast median yield for the entire NEAUS' sorghum-cropping region at the end of February as 2.38 t/ha, which is well below the long-term median of 2.97 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 2.32 t/ha, or higher than 2.44 t/ha. The outlook forecast range has now converged to very much below the long-term median. 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 follows:

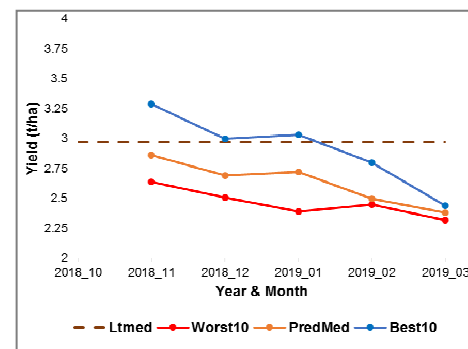
Region	Predicted Median (50%)	DFY (%)	Percentile (%)	Long-term Median
SEQ	2.56	-37	1 st	3.63
CQ	1.64	-45	1 st	2.39
SWQ	1.77	-30	1 st	2.30
QLD	2.04	-35	1 st	2.69
NNSW	3.23	-14	5 th	3.51

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

With the summer cropping season well into harvest (for early planted crops) across most regions, yield expectations are very much below (< 30%) the long-term median yield expectation for almost the entire NEAUS's cropping region. The exception was for NNSW, which had yield departures not as far below the long-term median (< 14%). The range of possible outcomes has now converged across most regions and projected rainfall will have less impact on final predicted yields except for very late planted crops in CQ. The current SOI phase of "rapidly falling" 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. 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: State level yield forecast trajectories (10th, 50th and 90th 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 to 2000, 2006, 2011 & 2016. Oz-Sorghum MII showed correlations (r) ranging from 0.62 to 0.93 within the main sorghum producing shires (35) of NE Australia. These shires contributes to 96% of total average production of all sorghum producing shires.