SEASONAL CROP OUTLOOK

Sorghum: March 2021

SUMMARY

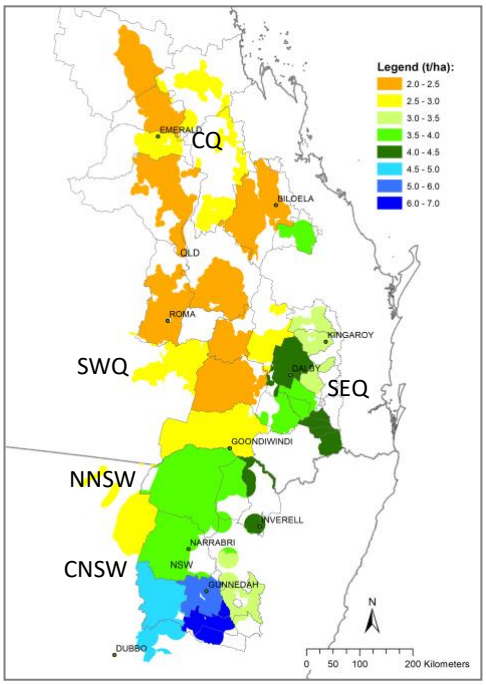
In 2020/21 sorghum yield is predicted to be above average across most of north-eastern Australia's (NEAUS) summer cropping region. At a national level (NEAUS) the forecast yield now has converged to 3.31 t/ha, which is close to the 88th percentile compared to all years. However, there remains large variation in the outlook among local regions. Specifically, almost all areas of NSW and southwest QLD (SWQ) have predicted yields close to or above the long-term median expectation, while most areas in south-eastern QLD (SEQ) and central QLD (CQ) have sorghum yield expectations slightly below the long-term median yield expectation for those regions. Note: This yield outlook is based on an average of a maximum of three plantings, depending on timing and rainfall through the summer planting period. In addition, this is based on sowings after a crop-free (fallow) period during the winter season and therefore areas with longer fallow practices are likely to have better yield prospects for the coming season.

GENERAL CONDITIONS

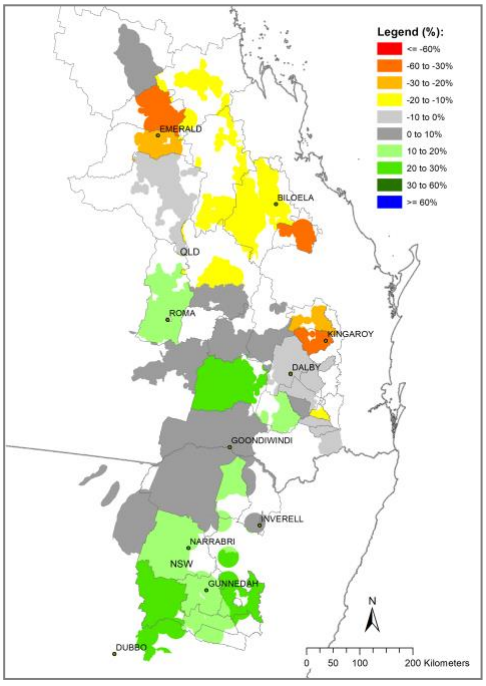
Although highly variable, rainfall during February 2021 was average to below average in most of QLD while most areas in NSW region had average to above average rainfall for that period. A similar spatial pattern was observed for rainfall recorded during September to end February. Any rainfall recorded 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. Summer crop area planted within the traditional sowing window (Sept to Dec 2019) was low. The recent pattern of the SOI, i.e. "consistently positive", at the end of February indicates an average chance (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).

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 120-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 positive" 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).

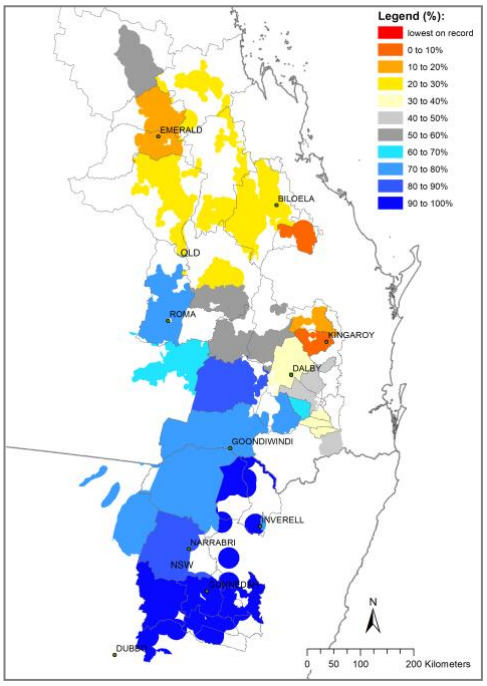


Map 1: Simulated long-term median shire yield derived from 1901 to 2019 climate using 2021 technology.



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

Yield outcomes vary geographically across most of the NEAUS summer cropping region. Map 2 shows that for this season, most areas in SWQ and NSW have positive forecast median yield deviations of 0 to 30% above the long-term median, while most areas in SEQ and CQ have negative forecast median yield deviations (-40% to 0) below the long-term median for that region. Furthermore, as shown in Map 3, almost all yield outcomes in NSW and SWQ are in the 60% to 90% percentile compared to all yield expectations over the last 120 years. In contrast, parts of CQ and most of SEQ are showing yield outcomes in the 20th to 40th percentile range. *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 this remains an important factor. The probability of yield outcomes presented here does not directly translate to total production figures.*



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

Poor Crop Chance

At present, there are currently no shires with a highly increased chance for sorghum crop yield falling below the 10th percentile 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.

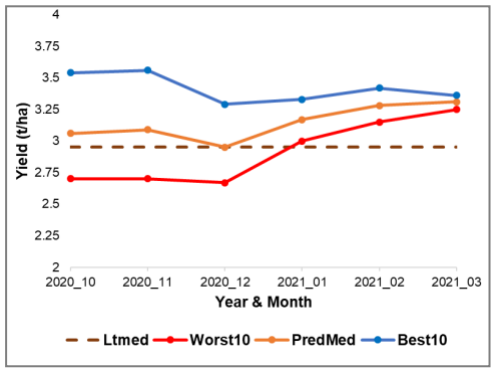
State Outlook

The current regional outlook shows the forecast median yield for the entire NEAUS sorghum-cropping region on the 1st March is 3.31 t/ha, which is above the long-term median of 2.95 t/ha (Graph A). Most of the forecast distribution has now converged to above the long-term median yield at a national level. At local regional level, Queensland (QLD), central Qld (CQ), southwest QLD (SWQ), southeast Qld (SEQ) and northern NSW (NNSW) (Map 1), the forecast yield (t/ha) ranges are as follows:

Region	Median (50%)	DFY (%)	Percentile (%)	Lt Median
CQ	2.13	-13	26	2.45
SEQ	3.56	-2	48	3.62
SWQ	2.59	11	77	2.33
QLD	2.76	2	57	2.72
NNSW	4.08	15	92	3.55

** DFY is the percentage departure of the forecast shire median yield from the long-term shire median (Lt Median) sorghum yield.*

Yield expectations very across the regions. Specifically, SEQ and CQ regions have yield expectations close to or below the long-term regional sorghum yield expectation (i.e. 48th & 26th percentiles, respectively). SWQ and NSW have predicted medians in the top 25th percentile ranked relative to all years. The current SOI phase ("consistently positive") indicates chances to receive above average rainfall are similar 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. Finally, this report specifically quantifies the likely predicted sorghum yield outcomes, if a crop was planted, and is therefore not a total production estimate.



Graph A: NEAUS 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 was ran 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 contribute to 96% of total average production of all sorghum producing shires.