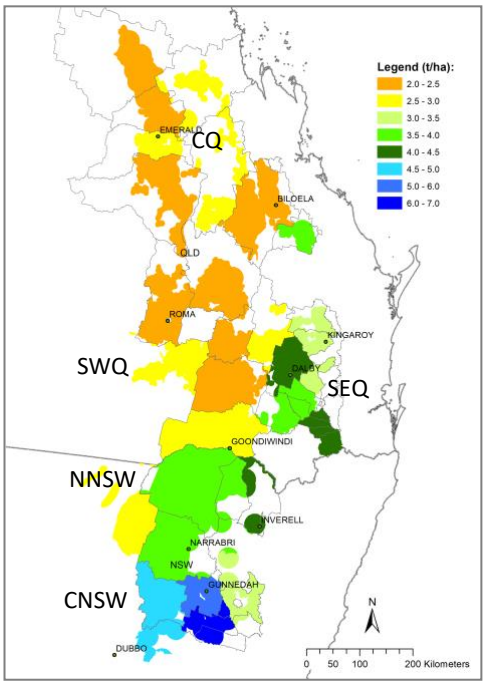
SEASONAL CROP OUTLOOK

Sorghum: January 2021

SUMMARY

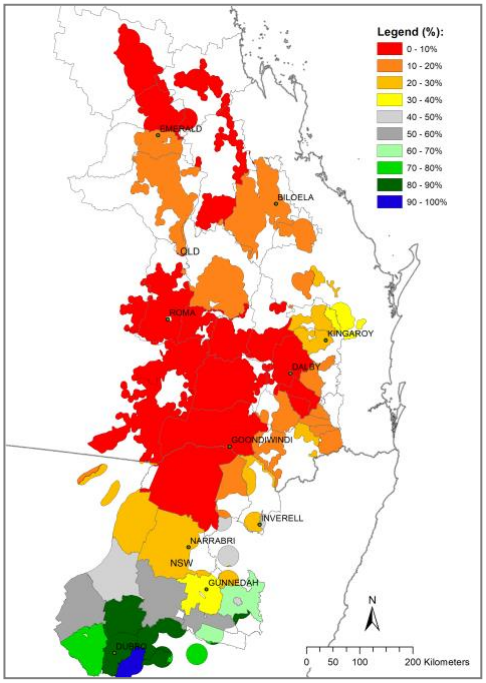
At this early stage of the 2020/21 summer crop season, current soil water conditions and seasonal rainfall outlook indicate a reasonable chance for a close to average yielding sorghum crop. There remains, however, large variation in the outlook among local regions. Most areas in QLD have sorghum yield expectations close to or slightly above the long-term median yield. The exception is for most parts of SEQ, which have yield expectations below the long-term median yield. Most areas in central New South Wales have sorghum yield expectations above the long-term median yield for that region. Furthermore, areas planted to sorghum were overall lower than average. Widespread average to above average rainfall is needed, during the next month to prevent any further stored moisture deficiencies and to induce some late summer plantings across some parts of SEQ and specifically CQ where late sowings can occur until late February. This crop outlook is based on a crop-free (fallow) period through the winter season and therefore areas with longer fallow practices are likely to have better yield prospects for the coming season.



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

GENERAL CONDITIONS

During December 2020 average to below average rainfall was recorded across most parts of the QLD summer cropping region, while most parts of NNSW received average to above average rainfall. However, rainfall recorded during October to December was below average across most of the NEAUS cropping region. This resulted in insufficient recharge of soil moisture levels and few opportunities for planting dry land summer crops (estimated to be less than 100k ha by mid-December for entire NEAUS). Furthermore, estimated stored soil moisture levels (simulated through winter fallow using APSIM) remained low (<30%) except for most parts of central NSW, which have soil moisture levels above 50% of potential available soil moisture (Map 2). Widespread above average rainfall is needed over the next month to induce planting, specifically in CQ where late plantings can occur until mid-February. The recent pattern of the SOI, i.e. "consistently positive", at the end of December indicates slightly increased chance of receiving above average rainfall for most of the summer grains cropping region over the next 3-months (www.longpaddock.qld.gov.au). Note: this outlook is only applicable to a short winter fallow cropping system (~7 month fallow period).

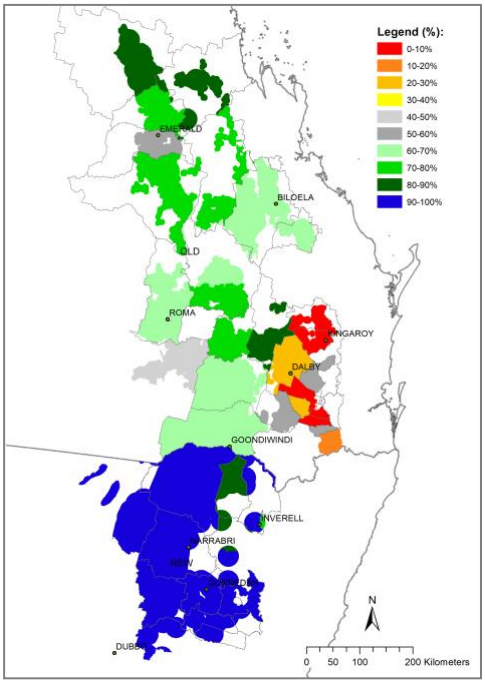


Map 2: Aggregated soil water recharge status (%) as at 1st January 2021. A short ~7-month winter fallow was simulated from 1st of April 2020 to end of December 2020.

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 simulated performance over the past 120-years using an agro-climatic model for sorghum with long-term rainfall records. 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 and projecting forward based on rainfall conditions in years with SOI phase similar to this year i.e. "consistently positive" at the end of December. 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).

Predicted yield outcomes improved across most regions except for some parts of SEQ. This is mainly a result of the current improved outlook in combination with the mainly average to above average rainfall recorded during December across most of the NEAUS summer crop region. This resulted in an overall improvement in the sorghum yield outlook to slightly above average chance (60 – 70%) of exceeding the long-term median yield for most areas in the NEAUS summer grain region (Map 3). More specifically, most of CQ and SWQ regions have a slightly increased chance (60% to 80%) of exceeding the long-term median shire yield, while most of SEQ has a reduced chance (< 30%) of exceeding the long-term median yield for that region. In contrast, NNSW has an increased chance of recording above average sorghum yields. The distribution of likely yield outcomes in almost all of NNSW has now converged closer to the final yield. At this early stage of the season, the range of likely yield outcomes for all of QLD (see State Outlook below) 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. *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.*



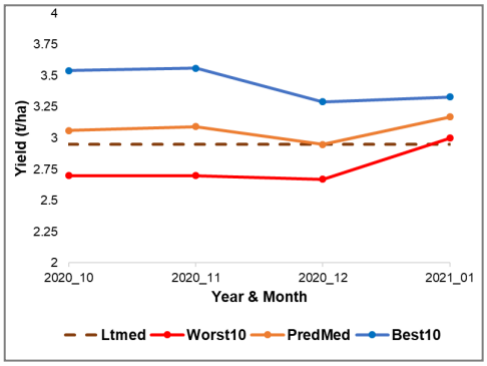
Map 3: Probability of exceeding the long-term simulated median shire sorghum yield.

Poor Crop Chance

At present, this early in the growing season, there are currently no shires with an 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 January is 3.17 t/ha, which is slightly above the long-term median of 2.95 t/ha (Graph A). There is however, a 10% chance that the state yield could be lower than 3.00 t/ha, or higher than 3.33 t/ha. At local regional level, Queensland (QLD), central Qld (CQ), southwest QLD (SWQ), southeast Qld (SEQ) and northern NSW (NNSW) (Map 3), the forecast yield (t/ha) ranges are as follows:



Graph A: NEAus yield forecast trajectories (10th, 50th and 90th percentiles).

Region	Worst 10%	Median (50%)	Best (%)	Lt Median
CQ	2.21	2.68	2.77	2.45
SEQ	3.12	3.41	3.83	3.62
SWQ	2.17	2.49	2.71	2.33
QLD	2.47	2.78	2.99	2.72
NNSW	3.66	3.80	4.01	3.55

**Lt Median: long-term median.*

At this early stage of the season, all regions have predicted yield outcomes close to or slightly above the long-term regional sorghum yield expectation. The exception is SEQ, which has a predicted yield outcome below the long-term sorghum yield. However, a wide range of possible outcomes still exists. This will narrow as the season progresses and the actual climate experienced is incorporated in the analysis. The current SOI phase of "consistently positive" indicates a slightly increased chance to receive above average rainfall in most parts of NEAUS summer cropping region over the next 3-months. Widespread above average rainfall is needed over the next couple of months to induce late summer crop plantings, specifically in CQ where planting can occur until late February.

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.