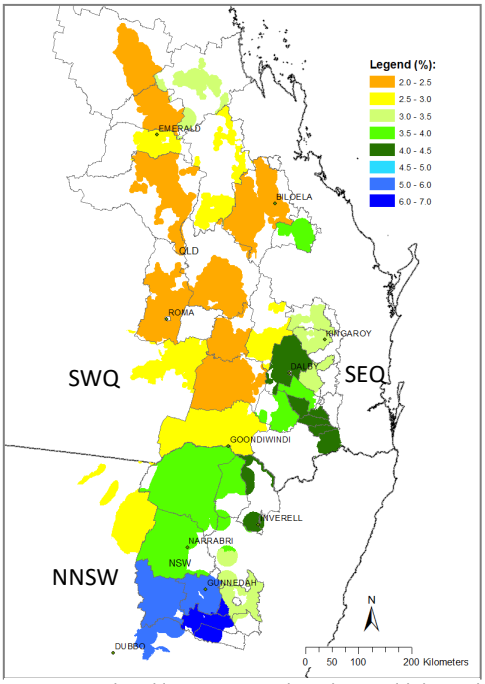
SORGHUM OUTLOOK: FEBRUARY 2023

SUMMARY

The prospects for an above average sorghum crop for the entire Australian summer grains region for 2022/23 remains favourable with expected yield above the long-term median at a national level. However, variation in the outlook among local regions exists. Specifically, most areas in northern CQ, and northern NSW have sorghum yield expectations above to well above the median (>70%), while most areas in southern QLD have sorghum yield expectations close to or below the long-term median yield (40% - 60%). This crop outlook is based on a crop-free (short fallow) period through the winter season and therefore areas with longer fallow practices are likely to have better yield prospects for the coming season. It should be noted, this is midway in the growing season, and the range of likely sorghum yield outcomes remains wide.

GENERAL CONDITIONS

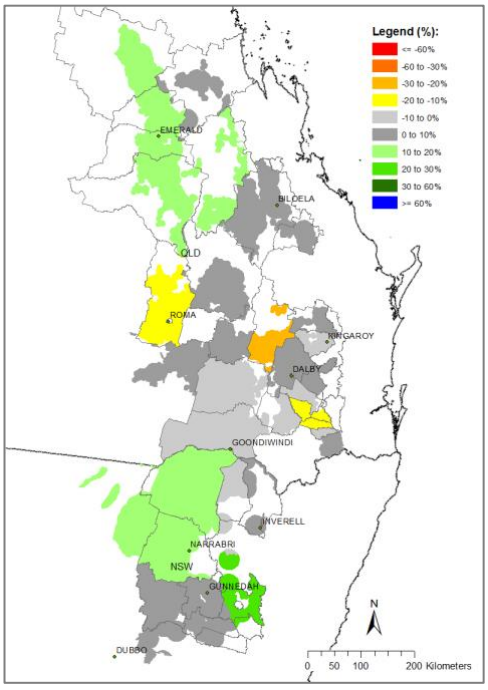
Rainfall during January was below to very much below average for most parts of south-eastern QLD and northern NSW. The exception was most parts of CQ, which received above average rainfall. During the previous six months rainfall recorded was mainly average for SEQ, while CQ and NSW received above average rainfall for that period. The recent pattern of the SOI, i.e., "Consistently Positive", at the end of January indicates an equal chance (50:50) of receiving above or below average rainfall for most of the summer grains cropping region (www.longpaddock.qld.gov.au). Although, atmospheric indicators for ENSO are remaining in a La Niña phase, most models are predicting a return to a Neutral ENSO by February. This remains the case. Progress of the climate indicators such as the SOI and sea surface temperature anomalies can be followed here (www.bom.gov.au/climate/enso). Note: this outlook is only applicable to a short winter fallow cropping system (i.e., No winter crop during 2022 season).



Map 1: Simulated long-term median shire yield derived from 1901 to 2022 using 2023 technology.

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 122-years using an agro-climatic model for sorghum with long-term rainfall records. The percentage departure of the forecast median for this season from the long-term median shire sorghum yield is given in Map 2. 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 extremely poor chance of having crops above the long-term median yield, whereas areas coloured in dark grey, green and blue have moderate to high chances of producing higher yielding crops. Maps 2 & 3 are derived by considering conditions up to the end of January 2023 and projecting forward based on rainfall conditions in years with SOI phase similar to this year i.e., "Consistently Positive" at the end of January. 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 2: Percentage departure of the current forecast median shire yield from the long-term shire median yield.

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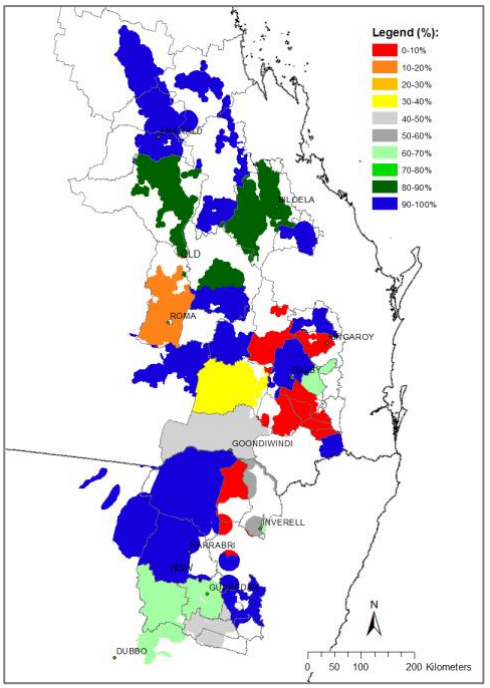
The current outlook combines effects of the recharge of soil moisture profiles and the current rainfall outlook, which is based on analogue years from history with the same SOI phase to that at the end of January 2023. This resulted in an above average chance of exceeding the long-term median yield for most areas in the northern NSW and CQ summer grain regions (Map 3). The exception was for parts of SEQ and SWQ, which have below average chances of exceeding the long-term median for those regions. At this stage of the season, the range of likely yield outcomes for the 2022/23 season (see Regional Outlook below) have narrowed further to above the long-term medial yield estimate at national level. *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 a key factor*.



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

Cropping AREAS

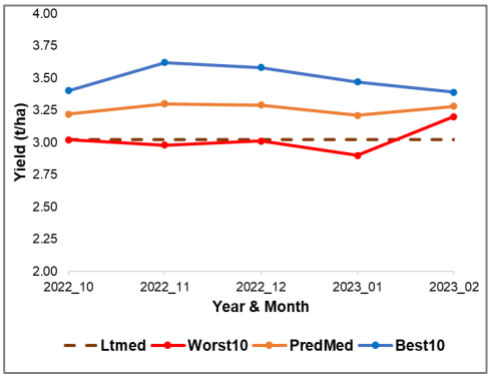
As at early January, the total green summer crop area from north of Dubbo is around 2.35 M hectares, i.e., 28% of the total potential land use (LU) cropping area (dry land and irrigated) across the entire NEAUS. At a regional scale, this equates to around 24%, 25%, 49% and 26% relative to the total available LU area for NNSW, SWQ, SEQ and CQ, respectively. Most of the areas in CQ are likely irrigated cotton since sorghum is sown mainly from Jan to mid-February. Note: Areas sown to summer crops (sorghum (main summer crop), cotton (irrigated mainly), maize, sunflower, mungbeans etc..), were derived from green-up by utilising high-resolution satellite imagery (return period of 5-days and from after 15th September) and mathematical algorithms applied to current land use cropping patterns. In addition, the first GCM-driven sorghum yield forecast was done as a prototype but is not shown here (source: CropVision ARC LP).

REGIONAL OUTLOOK

The current regional outlook shows the forecast median yield for the entire NEAUS sorghum-cropping region on the 1st of February is 3.28 t/ha, which is above the long-term median of 3.02 t/ha (Graph A). In addition, most of the forecast distribution (80%) has moved to be above the long-term median yield at a national scale (i.e., between 3.20 and 3.39 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:

Region	Worst 10%	Median (50%)	Best 10%	Lt Median
QLD	2.75	2.83	2.90	2.79
CQ	2.59	2.77	2.83	2.49
SEQ	3.49	3.57	3.63	3.69
SWQ	2.25	2.35	2.48	2.43
NNSW	3.88	4.00	4.17	3.65

**Lt Median: long-term median.*



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

The forecast distribution has now further converged to well above the long-term median for of NEUAS. This is due to sown summer crops approaching maturity and harvest across most of the southern regions. Crop yield prospects in SEQ and SWQ are close to or slightly below the long-term median, while summer cropping prospects in CQ and NNSW are for an above average yield expectation. However, a range of outcomes still exists at sub-regional level. This range will narrow as the season progresses and the actual climate experienced is incorporated in the analysis. The current SOI phase of "Consistently Positive" shows chances similar to climatology (50:50) across most regions except in parts of CQ and SWQ and NNSW, which are having a slightly increase chance of receiving above average rainfall over the next 3-months.

Disclaimer: Crop industry forecast, and outlook reports are based on data collated by researchers at The University of Queensland and should only be used as a guide when making business decisions.

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 run from 1 April the year before harvest 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.

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