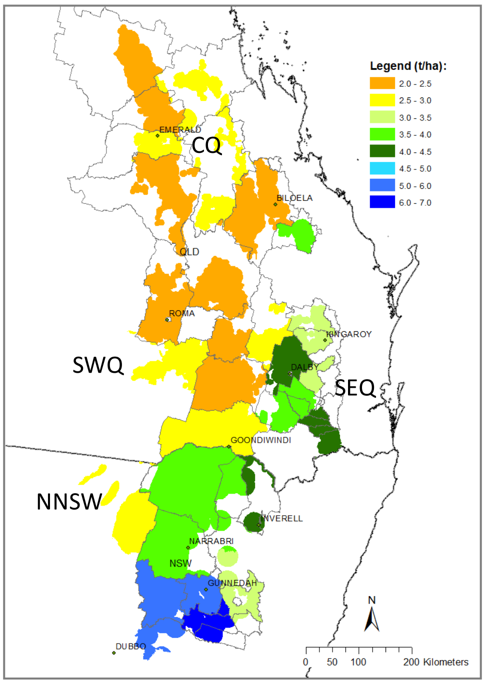
SEASONAL CROP OUTLOOK

Sorghum: March 2022

SUMMARY

The sorghum crop across the Australian summer grain region for 2021/22 is predicted to be well above average. At a national level (NEAUS) the forecast yield now has converged to 3.47 t/ha, which is above the 90th percentile compared to all years. However, there remains large variation in the outlook among local regions. Specifically, almost all areas of NNSW, SWQ and SEQ have predicted yields well above the long-term median expectation, while most areas in central QLD (CQ) have sorghum yield expectations below the long-term median for that region. Some areas in SEQ also had extensive flooding during early March, which could result in production losses. 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.



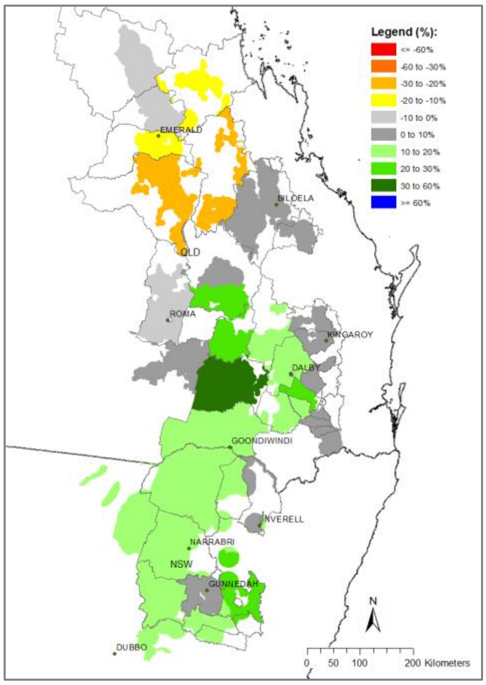
Map 1: Simulated long-term median shire yield derived from 1901 to 2020 using 2021 technology.

GENERAL CONDITIONS

Rainfall during February 2022 was average to above average across most parts of the NEAUS summer cropping region. Specifically, parts of SEQ recorded well above average, while most parts of CQ received a much below average rainfall period. This resulted in some extremely wet parts sepcifally, early March for parts of SEQ is likely to lead to production losses. At the same time most parts of CQ experienced early crop stress due to water limitation. The recent pattern of the SOI (i.e., "rapidly rising") at the end of February indicates a slightly reduced chance of receiving above average rainfall across 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.

OUTLOOK

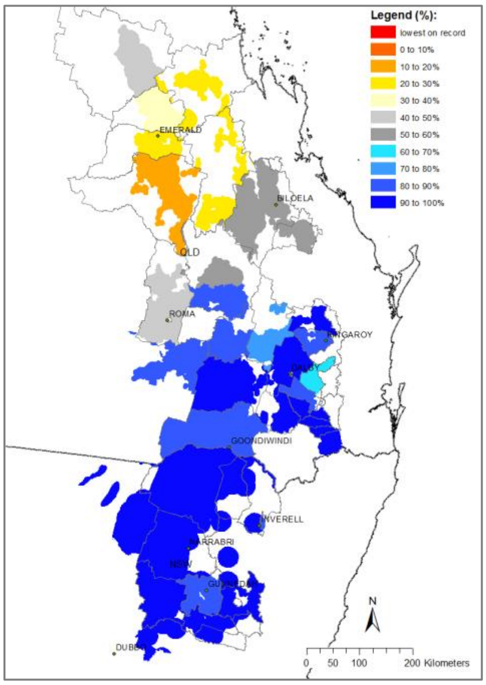
The benchmark for this outlook is the simulated long-term median shire sorghum yield within the broad NEAUS cropping region (Map 1). The median yield is based on predicted performance over the past 121-years using an agro-climatic model for sorghum with long-term rainfall records (see descriptive note 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. Maps 2 & 3 are derived by considering conditions up to date (end of February) and projecting forward based on rainfall conditions in years with SOI phase the same as this year - "rapidly rising" in the January to 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 2: Percentage departure of the current forecast median shire yield from the long-term shire median yield.

WORKING TOGETHER WITH THE QUEENSLAND GOVERNMENT

Yield outcomes vary geographically across most of the NEAUS summer cropping region. Map 2 shows that for this season, most areas in NNSW, SWQ and SEQ have positive forecast median yield deviations of 10% to 30% above the long-term median, while most areas in CQ have negative forecast median yield deviations (-30% to -10%) below the long-term median for that region. Furthermore, as shown in Map 3, almost all yield outcomes in NNSW, SWQ and SEQ are in the top 80% percentile compared to all yield expectations over the last 121 years. In contrast, some parts of CQ are showing yield outcomes in the 10th 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.*



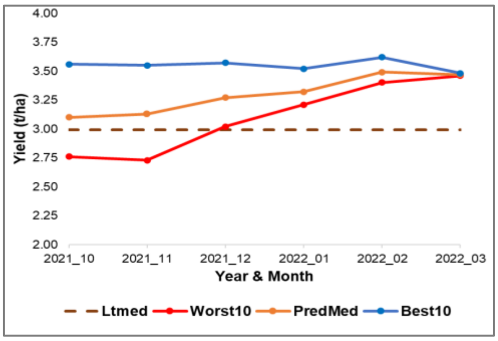
Map 3 Forecast median shire yield ranked relative to all years (%)

SUMMER CROP AREAS

As of 25th February 2022, total areas planted to summer crops were close to 1.3 million hectares (all cropping) and was around 15% of the total potential land use for NEAUS cropping region. This included mainly Cotton and Sorghum with fewer areas planted to mungbeans, maize, sunflower with some forage sorghum. In addition, areas can be divided into dry land and irrigated areas, which were around 12% and 43% as a percentage of the total potential land use, respectively across the entire NEAUS summer cropping region. Information was derived by utilising high-resolution satellite imagery (return period of 5-days) and mathematical algorithms applied to current land use cropping patterns (source: CropVision ARC LP).

Regional Outlook

The current regional outlook shows a forecast yield of 3.49 t/ha (16% above the long-term median yield). The forecast distribution has now converged to above the long-term simulated median yield (2.99 t/ha) for the NEAUS sorghum-cropping region (Graph A). At 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: State level yield forecast trajectories (10th, 50th and 90th percentiles).

Region	Median (50%)	DFY (%)	Percentile (%)	Lt Median
CQ	2.22	-10	29th	2.47
SEQ	4.19	14	91st	3.66
SWQ	2.82	18	87th	2.38
QLD	3.05	14	91st	2.75
NNSW	4.12	14	91st	3.60

**Lt Median: long-term median.*

All regions have yield expectations above the long-term sorghum yield expectation of each region. The exception is for CQ, which has a predicted median below the long-term median yield. The current SOI phase of "rapidly rising" indicates a slightly reduced chance to receive above average rainfall in most parts of the NEAUS summer cropping region over the next 3-months.

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 simulated from 1st 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.