CLIMATE ANALYSIS FOR COTTON PRODUCTION ACROSS NORTHERN AUSTRALIA

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Climate

FACT SHEET MARCH 2025

Climate is the most important factor impacting cotton growth and development and how the crop might be managed in northern Australia. Solar radiation, temperature and rainfall interact in unique ways to create both opportunity and limitations for cotton production and understanding how climate interacts with the crop is fundamental to success in northern Australia.

While no two wet seasons are identical, patterns of radiation, temperature, and rainfall can offer valuable guidance for agronomic management. Monthly climatic averages, available from the Bureau of Meteorology for major centres, only provide limited insight since these do not account for variability around the mean. Given the rapid growth and development of crops during the wet season, a month can represent a significant period. In contrast, median values along with their ranges on a fortnightly basis offer much deeper insight.

The following analysis presents the median values for radiation, daily maximum and minimum temperatures, and rainfall across various locations. These climate figures cover the calendar year from November onwards, marking the beginning of the Bollgard 3 sowing window in northern Australia. Importantly, the data also show the range around the median, indicating the top and bottom 10% of years, which reflects the variability for each site based on records dating back to 1960.

It's important to understand that this analysis compares fortnightly periods without showing how these periods may relate to each other within a given season. For instance, the driest 10% of fortnights in December at a specific location could be followed by the wettest 10% in February. This variability is particularly acute for rainfall, which is the most unpredictable factor. However, the fortnightly trends offer valuable insights into managing climatic risk across most seasons.

From the perspective of cotton production, several parameters can be used to provide rules of thumb to interpret climatic data. Research in the Burdekin region found that solar radiation is not limiting for growth when it reaches 24 MJ/m² per day, which is typical for sunny days in many northern locations during the summer months. Flower and boll shedding start to occur when radiation levels drop below 24 MJ/m² per day, and boll retention is unviable at levels of 13 MJ/m² per day or less. Warm nights (≥24°C) can lead to net energy losses due to increased respiration, resulting in fruit shedding (similar to the effects of cloudy days)

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and boll deformities, such as parrot beaking, due to impaired pollination.

High daytime temperatures (≥35°C) can affect establishment, especially on sandy soils with a high silica content, where surface temperatures can exceed 60°C and cause seedling desiccation. Excessive daytime heat can also disrupt photosynthesis and pollination, leading to flower and young boll shedding or boll deformities.

Cool nights (≤14°C) primarily hinder continued growth, so boll production should ideally be completed before cool nights become frequent.

While rainfall itself is not harmful to cotton plants, it plays a critical role in determining when rainfed cotton can be sown. The duration of the wet season and the final rainfall date can significantly impact the available growing season, especially in soils with limited water-holding capacity. Excessive rainfall can create challenges for field trafficability and nitrogen management. Additionally, rainfall is often associated with periods of cloudiness, which can lead to excessive vegetative growth as crops shed bolls; this growth may require management using Mepiquat chloride. Ideally boll opening should coincide with the onset of drier weather.

CONSIDERATIONS FOR BOLL SHEDDING

Boll shedding is a natural response to disruptions in photosynthesis that affect the plant's internal energy balance. While shedding cannot be entirely prevented, its impacts can be reduced through the following strategies:

1. **Avoidance:** Reduce crop exposure to environmental stresses during flowering and boll filling stages. This can be achieved by selecting sowing dates to reduce risks associated with cloudy weather or high temperatures during flowering. Additionally, irrigation can alleviate elevated temperature stress by enhancing evapotranspiration.
2. **Canopy Management:** Shedding can increase when low light conditions occur due to an overly leafy crop canopy, where large leaves on long stems and petioles in the upper canopy prematurely shade lower leaves. Managing canopy growth to reduce lower canopy self-shading will reduce fruit shedding particularly during climatic stress periods. Wider row spacing that improves light interception throughout the canopy can also assist although there are other trade-offs to consider regarding row spacing.
3. **Compensation:** Bolls shed during the early to mid-flowering stages can be compensated for when weather conditions subsequently improve by retaining fruiting positions in the upper and outer canopy. These positions may include those that would typically shed during the cutout stage or new ones encouraged through agronomic practice (e.g. irrigation), that promotes the development of additional fruiting branches. Compensation is more achievable after early-season shedding, as crops with fewer bolls are more likely to produce new squares from growing points. However, as crops approach cutout, encouraging compensation becomes challenging due to competition for resources between existing bolls and new growth. This is often compounded by shorter days and cooler temperatures, which limit the plant's ability to generate enough energy for both processes.

When attempting to encourage compensatory growth, consider the constraints of the growing season and the capacity for newly initiated squares to mature into bolls.

When attempting to encourage compensatory growth, consider the constraints of the growing season and the capacity for newly initiated squares to mature into bolls. Compensation is generally easier in irrigated crops, where growth is primarily limited by the length of the growing season (radiation and temperature). In contrast, rainfed crops may struggle to compensate if soil moisture becomes insufficient.

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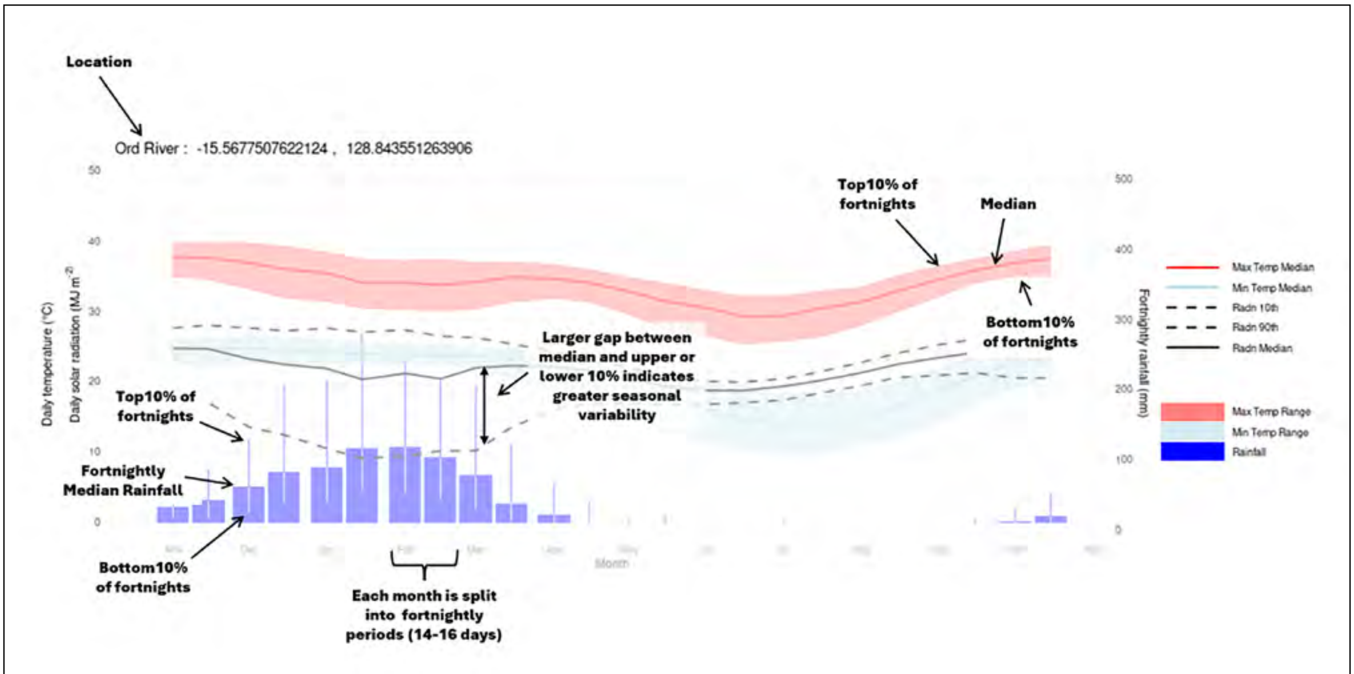
SOWING WINDOW CAVEAT

The sowing window information provides an assessment of how different climate factors are likely to affect boll setting, which typically begins 45-55 days after sowing, followed by the maturation phase. This information is generalised to help minimise exposure to climate-related risks that could negatively impact boll setting and maturation. However, it should be used only as a broad guideline. Individual factors – such as local conditions, soil type, infrastructure, seasonal forecasts and any other constraints – should be considered when applying this information to a specific situation and selecting a sowing time.

HOW TO INTERPRET CLIMATE FIGURES

Each figure represents an analysis of the SILO historical weather record data base spanning 1960-2024. The data presented depict the median (mid-point) value for daily temperatures (Min and Max) and radiation and total rainfall in fortnightly periods. Also presented are the value for the lowest and highest 10% value for each parameter that provides a measure of the range around the median.
Each month is split into a fortnight (14-16 days) depending on the number of days in each month.



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ORD RIVER, WA.

Rainfall can challenge field trafficability particularly for clay soils from late December to mid-March, with peak rainfall typically occurring between late January and early February

Radiation

Median radiation levels, affected by wet season cloudiness, become limited for flowering and boll filling from mid-January to the end of February. Cloudiness typically decreases rapidly in most seasons during the first weeks of March. From March until mid-May, median radiation levels are non-limiting for flowering and boll set. However, after mid-May, radiation becomes more limiting as day length decreases leading up to the winter solstice. This effect is somewhat mitigated by cooler temperatures, which slows growth and reduce the likelihood of shedding responses.

Max Temperatures

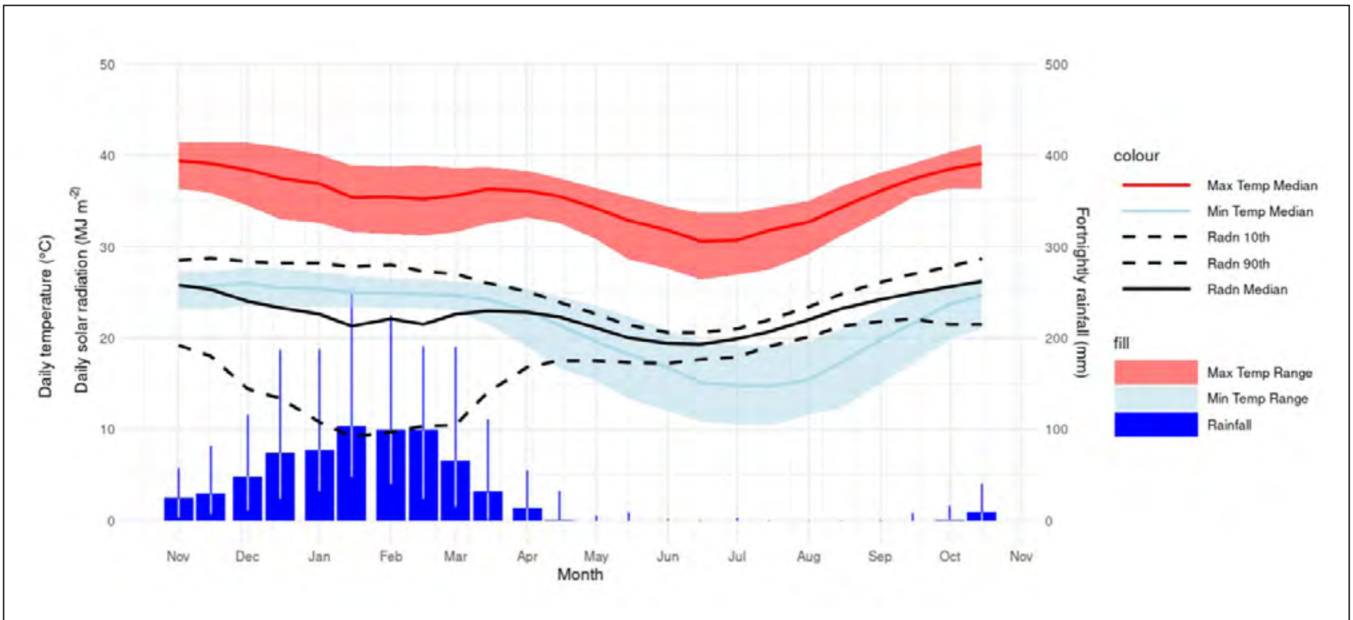
Daytime temperatures are limiting for cotton growth and establishment during November and December. Median maximum temperatures are most favourable for flowering and boll filling from mid-March until October, when they again become unfavourable.

Minimum Temperatures

There is a high risk of consecutive hot nights (≥24°C) from November to mid-March. Minimum temperatures are optimal for cotton growth from mid-March until the end of May. Cooler conditions in June and July can significantly slow growth and development. In the coldest 10% of years, cold shock may occur, which can reduce boll size and lead to shedding of flowers or boll deformities.

Rainfall

Rainfall can challenge field trafficability from late December to mid-March, with peak rainfall typically occurring between late January and early February. Rainfall decreases rapidly in March. Due to the high



likelihood of rainfall and the presence of clay soils, sowing between mid-January and early March will require an agile approach. Field designs should prioritise drainage to allow for timely re-entry of machinery.

Sowing Window

For irrigated cotton, sowing between mid-January and mid-March balances various climatic risks. Crops planted early in this window will begin flowering in mid February and may face constraints from cloudiness and high temperatures, leading to shedding of lower bolls. However, there remains enough season length for these crops to compensate for early boll losses. Crops sown in mid to late February largely avoid cloudiness and hot night constraints, with flowering starting in late March. This sowing period optimises crop climate exposure, but it coincides with the highest likelihood of rainfall interruptions, making successful sowing operations challenging in many seasons.

Crops sown in March, toward the end of the wet season, avoid cloudiness and hot temperature constraints for flowering and boll filling. However, those sown in late March may have lower yield potential due to cooler conditions in June, which coincide with cutout and peak boll filling. There may be opportunities to extend flowering and enhance yield in August and September, but this creates risks for defoliation and lint quality during picking in October due to potential storms. The other constraint to consider is that crops must be picked and destroyed by mid-October to be compliant with the Bollgard(R) Resistance Management Plan (RMP).

Rainfed cotton crops have not been attempted in Kununurra. December would be the most likely time to establish rainfed crops; however, the 8 or 12 week Bollgard 3 sowing window complicates the establishment of December-sown rainfed crops when irrigated crops are best sown between January and March. Planting raingrown later in the wet season (Jan/Feb) would likely be yield limited due to declining moisture. Soils with higher moisture holding capacity may offset some moisture risk, however, would increase risk associated of not planting due to interoperability during planting.

Cotton Info

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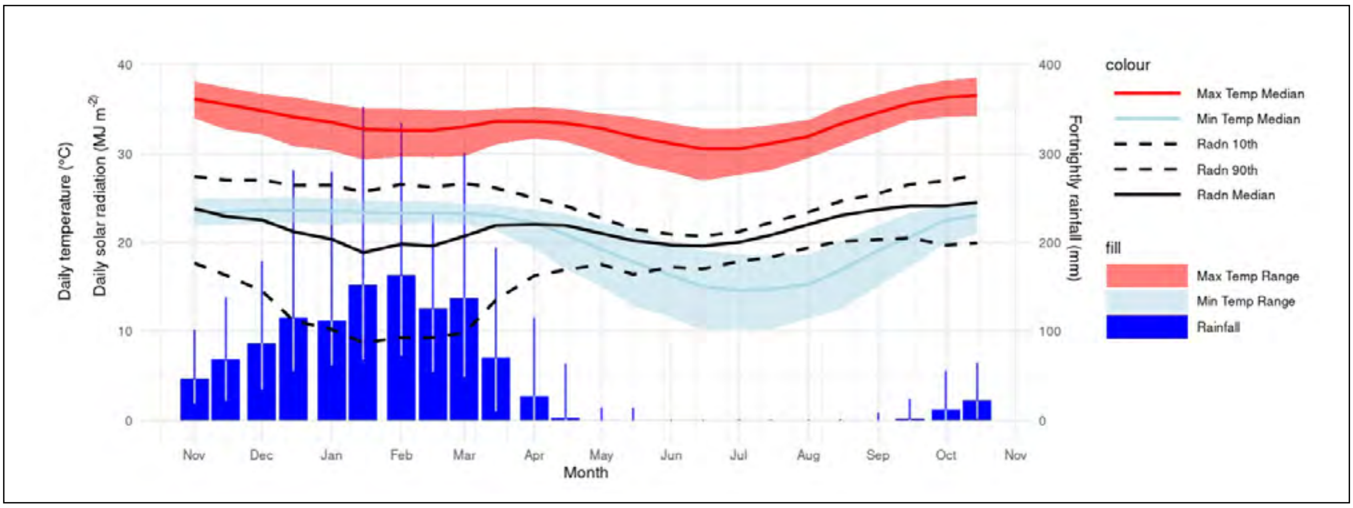
DOUGLAS DALY & KATHERINE, NT.

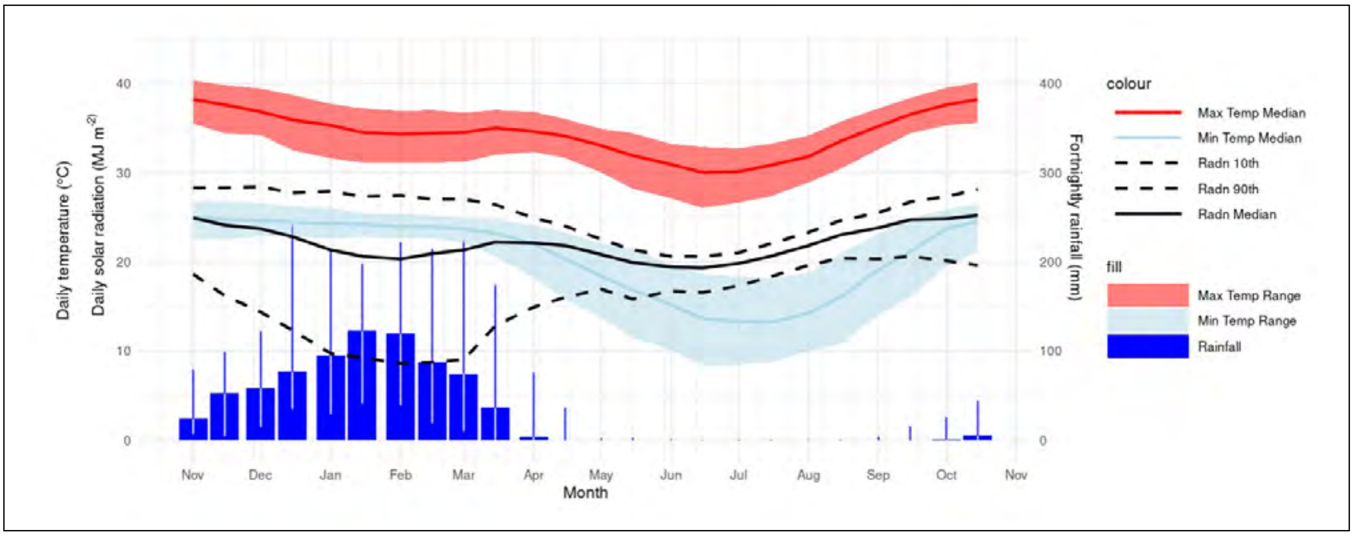
Radiation

In most years, radiation levels limit flowering and boll filling in January and February for the Douglas Daly and Katherine regions. Problematic cloudiness can occur from December to early March in the lowest 10% of years. It's important to note that shedding becomes more pronounced when radiation falls below 20 MJ/m^2 per day, with no bolls likely to be retained at levels below 13 MJ/m^2. In the lowest 10% of years, complete shedding of lower and mid-canopy bolls can be expected if flowering occurs in January and February. The patterns of available solar radiation are nearly identical for both regions, with Katherine experiencing slightly less cloud cover during the wet season.

Max Temperatures

Hot daytime temperatures pose challenges for crop establishment from November to late December, with Katherine being several degrees hotter during this period. In the highest 10% of years, seedlings may be exposed to extreme conditions, especially on sandy soils in both locations. The second half





of December, which tends to be more reliable for rainfall, can help mitigate the risks of high temperatures in the Douglas Daly. This relief is likely to occur later in January for Katherine. From February onwards, daytime temperatures become favourable for boll set and filling.

Minimum Temperatures

There is a high risk of crop exposure to hot nights (≥24°C) until mid-March. These hot nights can lead to fruit shedding and boll abnormalities, especially when combined with cloudiness. In the Douglas Daly, cold nights are likely to limit crop growth only in July; however, in the coldest 10% of years, June and August may also pose risks. Ideally, boll filling should be completed by early June. In contrast, Katherine is several degrees cooler, with cold nights likely to limit growth a month earlier, starting in June, and the risk of cold shock in the coolest 10% of years may occur by mid-May. Ideally, boll filling in Katherine should be finished by mid-May.

Rainfall

In most years, sufficient rainfall for sowing should occur by mid-December in the Douglas Daly and late December to early January for Katherine. However, problematic rainfall that affects field trafficability, crop emergence, and nutrient management can occur anytime from mid-December to early March. There is an increased likelihood of heavy rainfall in early March in the Douglas Daly (particularly during the wettest 10% of years), often influenced by tropical lows as the monsoon begins to recede, due to the region's proximity to the coast.

Sowing Window

For rainfed crops, December sowing best balances the risk of season length constraints due to declining soil moisture as the wet season recedes in March with the risk of cloud and high temperatures disrupting boll setting in January and February. A comparison of the driest 10% of fortnights in both regions indicates that sowing opportunities are less frequent in Katherine, where delays could extend

Boll rot losses are more damaging than fruit shedding as expended resources are greater and compensation more difficult due to internal competition between lower and upper canopy fruit positions.

through until February in dry years. In these dry periods, fortnights with less than 50 mm of rainfall may not provide enough moisture to mitigate high temperature risks and facilitate reliable crop establishment. In contrast, even in the driest years, the Douglas Daly can expect 60–70 mm of rain per fortnight during January and February, reducing the risk of not being able to sow.

Earlier November sown crops would commence flowering in January and are likely to be heavily affected by cloudiness induced fruit shedding with crops shedding all lower canopy bolls and then becoming reliant on later set bolls essentially negating any earliness benefits. November sown crops have a risk of increased boll rot particularly where sunny conditions during January allow boll set and subsequent opening occurs in late February coinciding hot, humid and wet conditions. Boll rot losses are more damaging than fruit shedding as expended resources are greater and compensation more difficult due to internal competition between lower and upper canopy fruit positions. December sown crops have better potential to compensate in March for earlier fruit shedding losses compared with November sown crops.

Irrigated crops sown in early January will begin flowering in early March, helping them avoid most hot nights and cloudy days. However, January sowing will depend on soil type and weather conditions. Nitrogen must be applied and made available to the plants by the end of February for irrigated crops sown at this time. In Katherine, sowing beyond mid-January is best avoided due to the earlier onset of cooler overnight temperatures in May.

NORTHERN BARKLY TABLELANDS, NT.

Hot nights will cause fruit shedding and boll abnormalities. Cold nights are likely to begin limiting crop growth and development during June

Radiation

The median radiation level is approximately 24 MJ/m² per day from late December to mid-April, indicating that in about 50% of years, cloudiness is unlikely to limit flowering and boll filling. However, in 20-30% of years, cloudiness can be problematic, especially in February, where boll shedding becomes more pronounced when radiation falls below 20 MJ/m² per day.

Max Temperatures

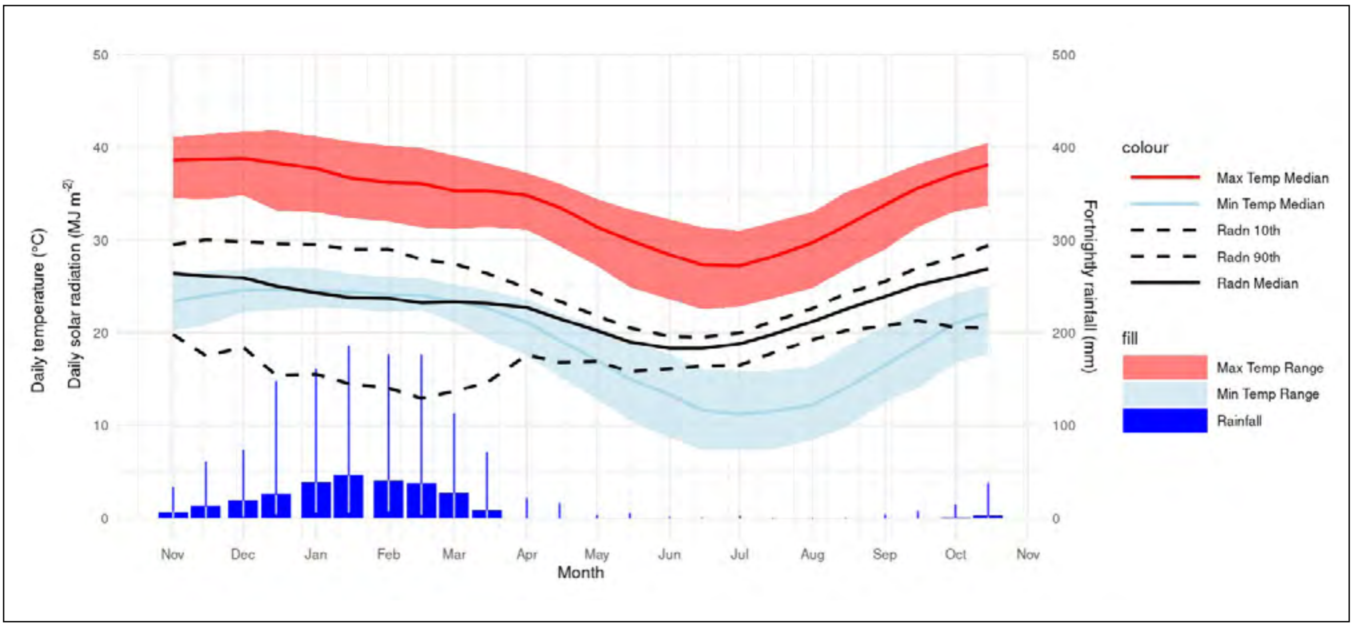
Hot daytime temperatures are likely to hinder crop establishment between November and late February, with median temperatures reaching or exceeding 35°C. During the hottest 10% of years in this period, temperatures can exceed 40°C. These high temperatures can restrict planting opportunities before January, as rainfall is often insufficient to counteract evaporation losses during this time.

Minimum Temperatures

Median minimum temperatures during December to February show a high risk for crop exposure to hot nights (≥24°C) until March. Hot nights will cause fruit shedding and boll abnormalities. Cold nights are likely to begin limiting crop growth and development from late May onwards. Ideally bolls should be largely matured by mid-May.

Rainfall

Sufficient rainfall for sowing should occur in most years by late January, although the driest 10% of years suggest that insufficient opportunity to plant will occur in some seasons. Planting opportunities are most likely to occur after periodic wet season rainfall bursts that can occur between mid-December to early March with peak activity late January until February.



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Sowing Window

Rainfed cotton. Several factors must be balanced to determine the best sowing period on the Barkley Tablelands. The primary constraint is rainfall, followed by high temperatures and their effects on crop establishment, flowering, and boll filling. Sufficient rainfall is generally unlikely before late December in most seasons.

Crops sown in late December will flower in mid-February and may face unfavourable temperature conditions for boll setting during the early weeks of flowering. Consequently, yield potential will rely on continued rainfall or access to stored moisture for boll setting in March and maturation in April to early May.

While some seasons may provide sufficient rainfall for sowing between late November and early December, high temperature constraints indicate that it would be prudent to delay sowing until at least late December. Early flowering may not provide any benefit due to heat and cloud-related fruit shedding occurring between late January and February.

Sowing in January, particularly in the first half of the month, appears to balance potential constraints effectively. However, sowing after late January may lead to season length limitations due to the onset of cooler night-time temperatures in June and July.

Irrigated cotton. If irrigation were available Late-December to mid-January sowing would appear to balance the primary climatic risk of hot temperatures (days and nights) with cool temperature constraints from mid-June. Late December sowing increases the risk of hot temperature effects and the chance of cloudiness in some seasons for early to mid-flowering from mid-February to mid-March. January sowing would delay the onset of flowering until March which becomes more favourable but season length is marginally reduced.

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ATHERTON TABLELANDS, NQ.

Radiation

Median radiation levels are limiting from February to July. In the worst 10% of years, problematic cloudiness occurs from mid-December to April, after which radiation remains low despite a reduction in cloud cover. As a result, boll setting and filling will be challenging in about 50% of years between February and April.

Max Temperatures

Due to the region's elevation above sea level, temperatures are generally mild, and maximum temperatures do not limit cotton production.

Minimum Temperatures

Minimum temperatures are optimal for growth in most seasons from December to May. However, they become limiting in July and August. Ideally, boll filling should be completed by early June.

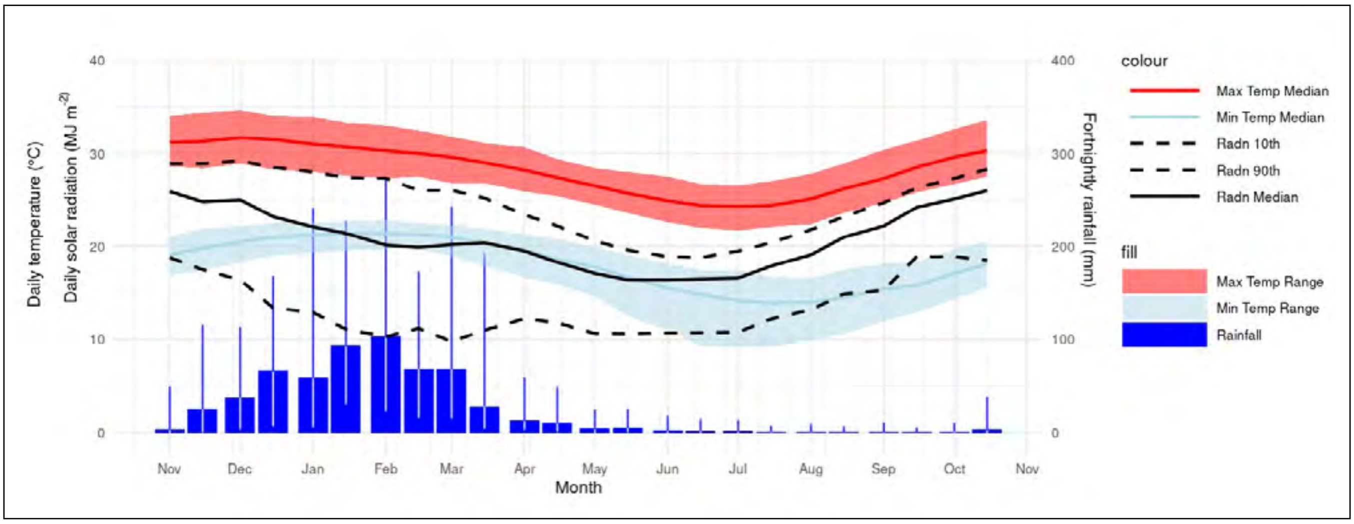
Rainfall

In most years, sufficient rainfall for planting dryland cotton is expected by mid to late December. However, in some years, rainfall and sowing opportunities may be delayed until late January. Notably, the peak rainfall intensity in the top 10% of years coincides with the lowest radiation levels, making March a challenging period for flowering cotton crops. For the wettest 10% of years, rainfall in late April and early May may lead to boll rot difficulties during boll opening.

Sowing Window

For both irrigated and rainfed crops, sowing in late December appears optimal, allowing flowering to occur in mid to late February. The primary risk for crops is cloudiness in March when bolls are being set and begin to fill. In about 30% of years, radiation will not be limiting; however, in 50% of years, low radiation will lead to varying degrees of fruit shedding, depending on the cloudiness pattern and its overlap with flowering. Planting later (mid-January onwards) to avoid this risk creates alternative risk for minimum temperature constraints in June and July and low radiation effecting boll development.

The crop's ability to compensate with irrigation in April and May will be limited by falling temperatures and declining radiation as days shorten. For rainfed crops, the cessation of rainfall in March would hinder the development of upper canopy compensatory bolls following shedding in February.



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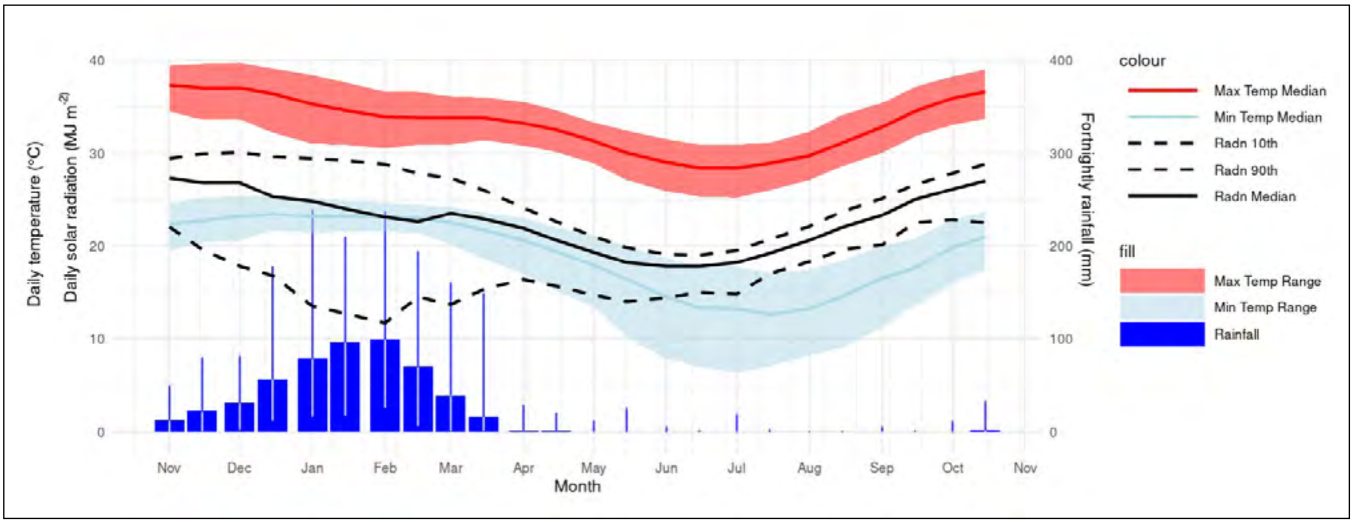


GILBERT RIVER REGION, N QLD.

Radiation

Median radiation levels become limiting in late February but improve in March, which allows for the potential compensation of fruit shedding. However, in the worst 10% of years, cloudiness can be problematic from mid-December to early April, with significant deviation from the median. Poor boll set may occur in 30-40% of years due to periods of cloudiness between February and April. In contrast, radiation is generally unlimiting in other seasons.

Maximum Temperatures

Maximum temperatures could pose challenges for establishment particularly on sandy soils from November until late December particularly if the onset of rainfall is delayed. Temperatures from January onwards are more suitable for establishment. Median temperatures are ideal for flowering and boll filling between February and mid-May.

Minimum Temperatures

The region has a moderate risk of hot nights (≥24°C) from late November until mid-February. The minimum temperature range across all years is ideal between late February and May. Minimum temperatures become limiting for growth in July and August and in some years by early June. Ideally boll fill should be completed by early June.

Rainfall

Rainfall intensity peaks in early February although deluges can occur from late December until end of March. Rainfall for planting dryland cotton should be sufficient in most years by the beginning of January.

Sowing Window

For irrigated crops, early to mid-January is an ideal sowing window that would coincide the commencement of flowering with the beginning of March, taking full advantage of good radiation and temperature conditions until the end of May.

For rainfed crops, planting in December would be preferred to extend the availability of moisture, however, compared with other northern centres, planting opportunities in December are less frequent. Rainfed crops sown in January are unlikely to reach full potential with rainfall diminishing rapidly by late March predisposing crops to premature cutout.

FLINDERS RIVER REGION, N QLD – ETTA PLAINS & RICHMOND.

Critically, the onset of cool temperatures occurs sooner at Richmond and notably are 3-4°C cooler during the winter months

Radiation

In the Flinders region, radiation is non-limiting, except during the mid-dry season from May to July. Median radiation levels from March to May are sufficient for flowering and boll filling. Even in the lowest 10% of years, radiation levels are still higher than in other centres like Emerald and Georgetown. In overall terms production risk associated with cloudiness are low.

There is little difference between Richmond and Etta plains in terms of available radiation and risk of wet season cloudiness.

Max Temperatures

Very high daytime temperatures are limiting for cotton establishment and growth between November and early January. With the provision of irrigation on clay soils or with some form of stubble cover, crop establishment during December should be achievable. However, sowing earlier in November would increase exposure to the high temperature risk period. For 10-20% of years high temperature may prevent crop establishment in December. Watering up may help cool the seed bed for several days following planting aiding emergence and early establishment. There is little practical difference between the upper and lower Flinders in terms of maximum temperatures.

Minimum Temperatures

Hot nights (≥24°C) are a key risk for greater than 50% of years throughout January and February. The upper Flinders is 1-2°C cooler during the summer period compared with Etta Plains although the overall trend is very similar. Median temperatures between mid-June and mid-August are too cold for effective growth and boll filling across the Flinders region. Critically, the onset of cool temperatures occurs sooner for the upper Flinders and is notably 3-4°C cooler during the winter months Temperatures are likely to be limiting for growth at Richmond in at least 50% of years from the start of May and the middle of May for Etta Plains. The risk of frost and potential severity is greater for Richmond than Etta Plains.

Bottom 10% of years have cold shocks from mid-April at Richmond and early May onwards for Etta plains. To minimise overnight cold temperature risks boll fill should be largely complete by the end of April.

Rainfall

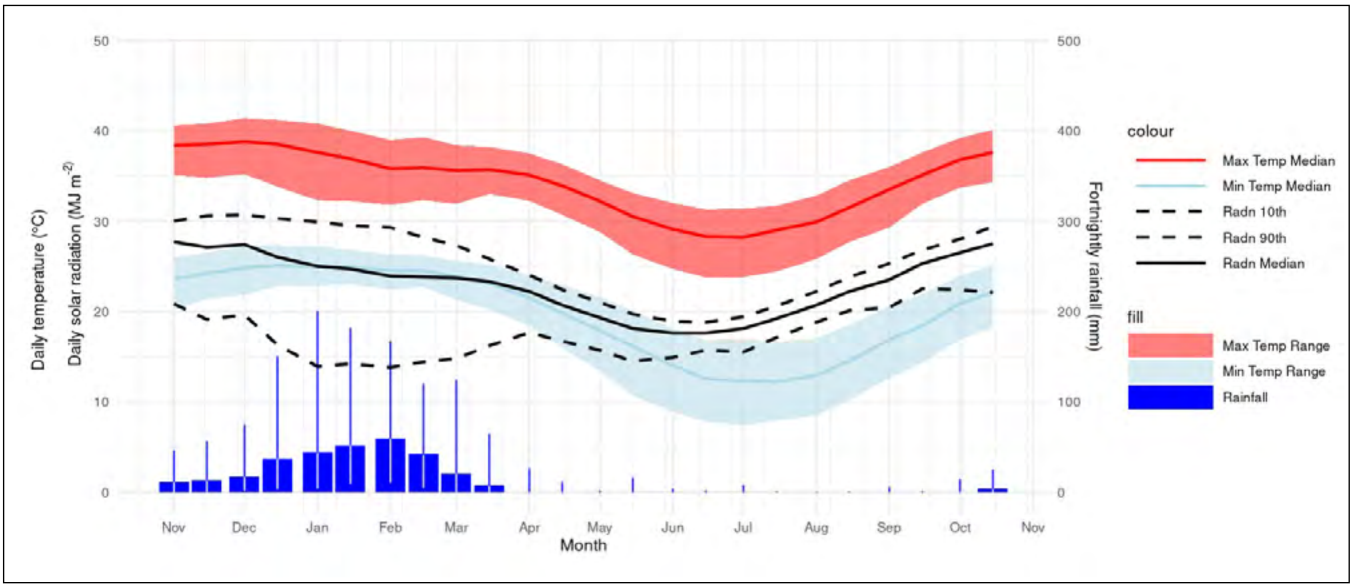
Median years suggest that rainfall is unlikely to be a regular impediment for field trafficability and sowing in December across the Flinders. However, when deluges occur the top 10% of years show amounts up to 150-200mm of rain within a fortnight with larger totals occurring in the lower Flinders. For rainfed crops, there will be limited opportunities for sowing prior to late January in most seasons across the Flinders region. This creates a conflict for season length which would be capped at 3-4 months due to declining radiation and minimum temperature constraints from May onwards. This indicates that opportunities for rainfed cotton are limited to 10-25% of years when sufficient planting rain would occur to enable sowing prior to the end of December.

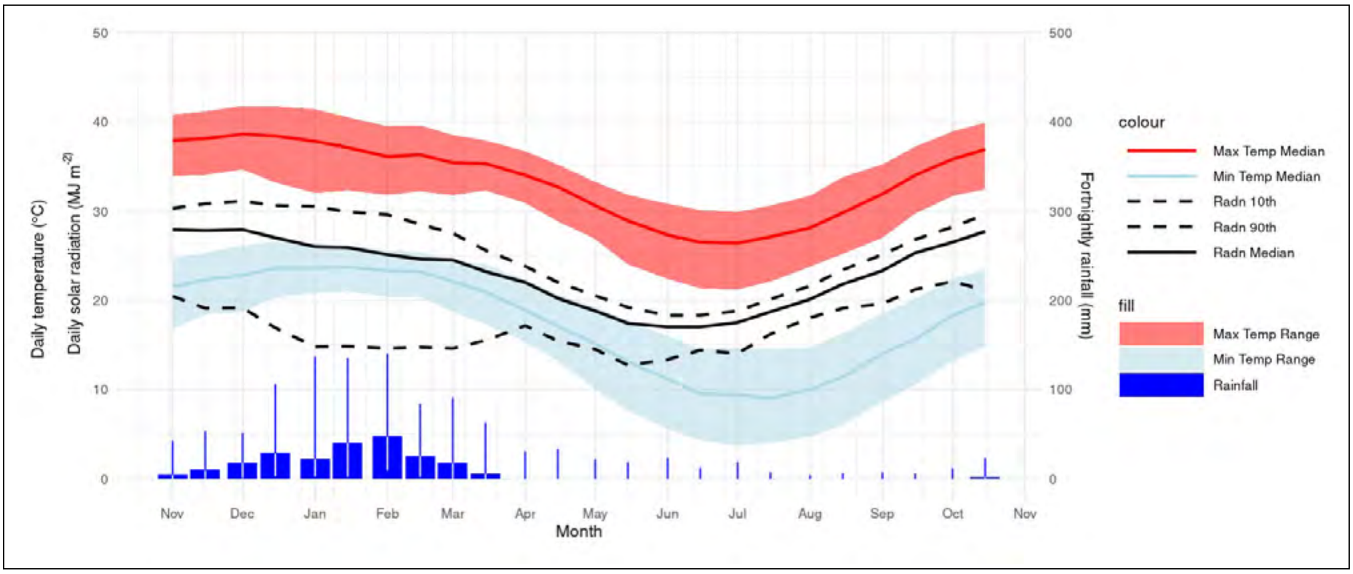
Sowing Window

For irrigated crops, sowing in December enables flowering to commence between late January to early February enabling boll maturation prior to May. However, December sowing will experience establishment difficulties in some seasons due to

high day time temperatures. Hot nights are likely to result in fruit shedding or deformity (parrot beaked bolls) during February. Yield potential is therefore likely to be reliant on compensation during March and maturation of those bolls by the end of April to early May. Therefore, yield potential will be dependent on weather conditions in the latter half of February and March.

For rainfed crops, sowing would ideally occur in December although opportunity to plant is unlikely to occur in the majority of seasons due to insufficient planting rain to offset high evaporation rates. January sowing is more likely; however, yield potential will decline rapidly from early January onwards due to minimum temperature and radiation constraints in May. A lack of rainfall in March will also likely reduce yield potential for rainfed crops with likelihood of follow up rainfall diminishing after mid-March. When rainfall and temperature limitations are considered rainfed cotton is only likely to be an intermittent opportunity crop (10-25% of years) with greater potential for success in the lower Flinders.





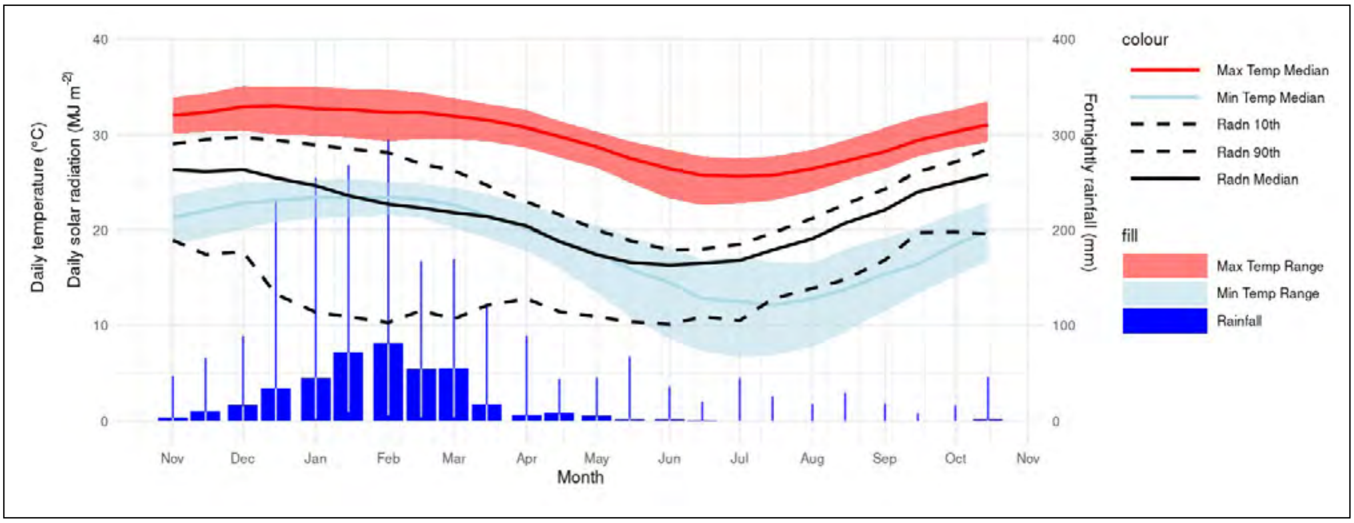
BURDEKIN & BOWEN REGIONS, N QLD.

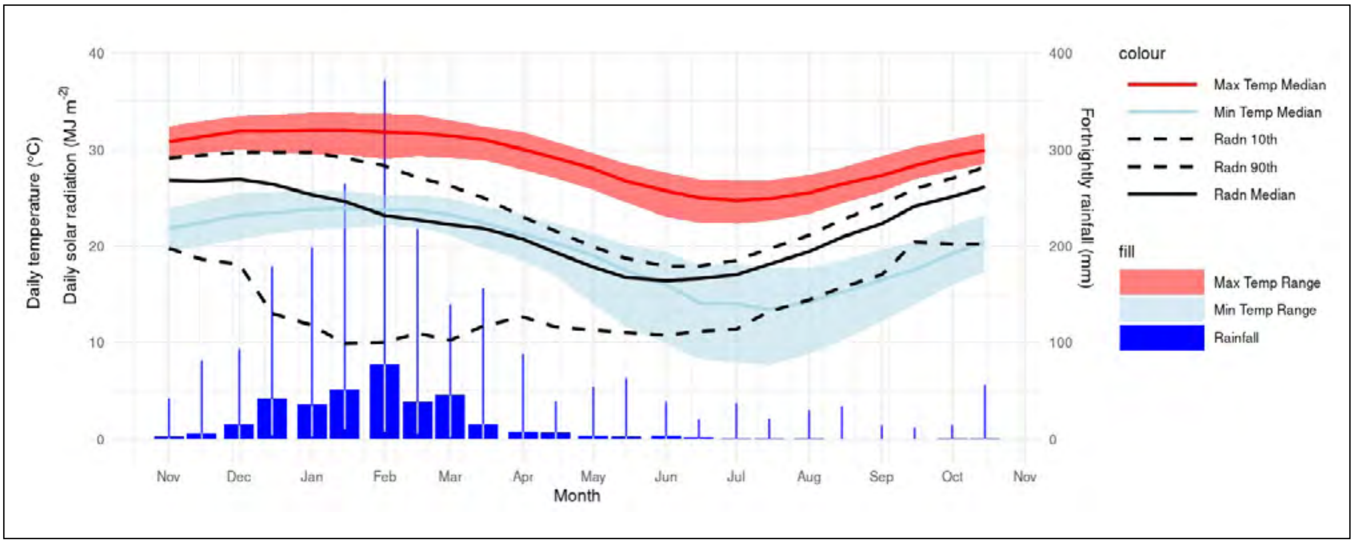
Radiation

Median radiation levels are limiting from February to July, with the Burdekin becoming cloudier earlier than Bowen, starting in late January. In the worst 10% of years, problematic cloudiness occurs from mid-December to April, after which radiation remains low despite a decrease in cloud cover. Boll setting and filling will be challenging in about 50% of years between February and April. Overall, there is little difference in radiation patterns between the Burdekin and Bowen regions.

Max Temperatures

Maximum temperatures generally do not limit cotton production in the Burdekin and Bowen regions. There would be short term exceptions where sowing might be best delayed by several days to avoid short term heat waves particularly during January if conditions are dry. Daytime temperatures between March and June are optimum for cotton growth and development.





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Minimum Temperatures

Minimum temperatures are ideal for most seasons from December to May. However, there is a risk of hot nights (≥24°C) in 10-20% of years between December and late February. Minimum temperatures become limiting for growth starting in mid-July. Due to the regions' proximity to the coast, the risk of frost is very low. Ideally, boll filling should be completed by early June.

Rainfall

Rainfall for planting dryland cotton should be sufficient in most years by mid-January. There is potential for very high fortnightly rainfall totals between January and March which reflects the coastal location of these regions and the influence of tropical low-pressure systems.

Sowing Window

For both irrigated and rainfed crops, sowing from late December to mid-January is optimal for aligning flowering with mid-February to early March. However, trafficability on clay soils in January can be challenging, depending on rainfall patterns. In 30-40% of years, radiation will not be limiting for crops sown during this period. Conversely, in 60-70% of years, low radiation levels can lead to varying degrees of fruit shedding, influenced by the pattern of cloudiness and its overlap with flowering and crop cutout.

When radiation conditions improve in March, there is enough time for irrigated crops to compensate from March to May by producing compensatory bolls (a top crop). A significant risk arises when cloudiness persists throughout March and into April, making it difficult to recover losses from April onwards due to the time required and the cooler temperatures typical in mid-winter that stymie growth.

Sowing earlier in November is not advisable, as flowering would likely occur in early January, coinciding with cloudy conditions. Bolls set in January may experience extensive boll rot when they open in late-February due to high rainfall and humidity.

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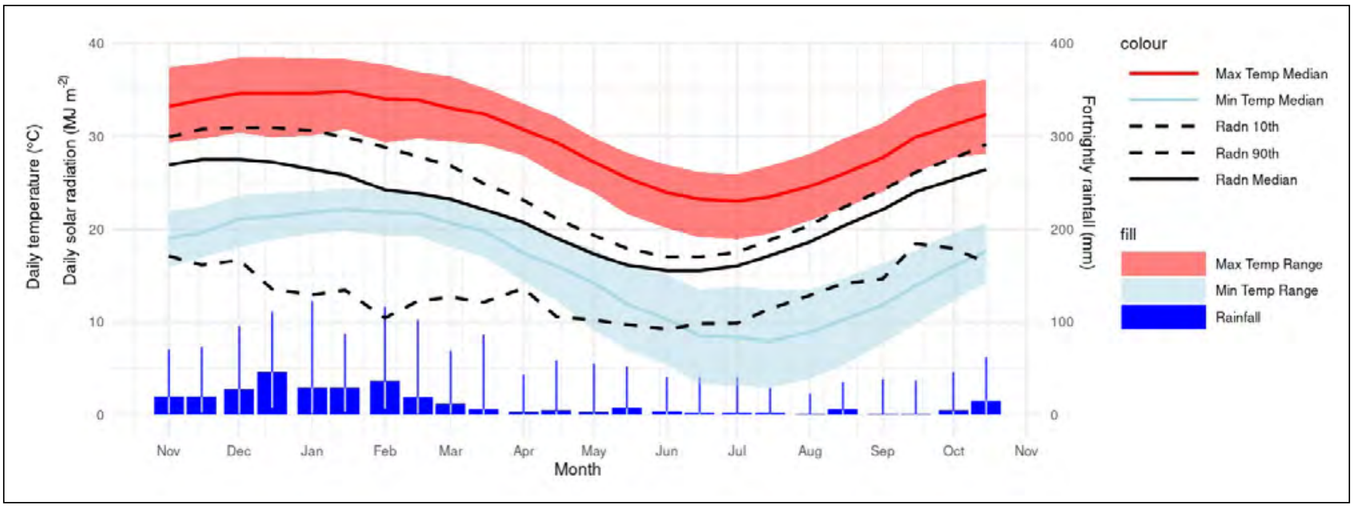

EMERALD, CENTRAL QLD.

Radiation

Median radiation becomes limiting from February through until July. Cloudiness increased from mid-December and can persist in the worst 10% of years until April. Radiation is most reliable between August and mid-December.

Max Temperatures

Maximum temperatures are unlikely to challenge crop establishment during November and December although care should be taken to avoid heat waves. Maximum temperatures during October to mid-December are conducive to growth before humidity increased late December.

Minimum Temperatures

There is a risk of hot nights impacting fruit setting and filling during January and February. Cold overnight temperatures become limiting for growth and development from May to August. Boll development should ideally be complete by the end of April.

Rainfall

Sowing opportunities for dryland cotton are likely to occur from November onwards with a peak in December. Rainfall in January and February present challenges for crops opening bolls with potential for tight lock, boll rots and lint colour down-grades.

Sowing Window

August and early September sowing offers the best opportunity to exploit the Emerald climate. Crops may be picked in January or early February or if disrupted by cloudiness or rainfall, sufficient season length remains (with irrigation) to set compensatory bolls and recuperate or add to yield potential. For raingrown crops, sowing in late November to December provides the best opportunity to maximise in crop rainfall and coincide picking with dry conditions from March onwards.

Emerald is exposed to similar climatic limitations as other Northern regions and can be badly affected by cloud and temperature extremes. The advantage that Emerald enjoys is the ability to plant early which creates a 10-month period in which the production strategy can be pivoted to grow crops for longer and overcome climate induced boll losses. However, crops sown in December at the end of the central Queensland window do not enjoy this advantage. Emerald provides an interesting case study in adapting and overcoming climatic challenges.

Climate

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