



NORTHERN NEWSLETTER FAR NORTH QLD EDITION

MARCH 2024 EDITION: ESTABLISHMENT TO FLOWERING

www.acresofopportunity.com.au

Welcome to the latest issue of the Northern Newsletter, brought to you by Acres of Opportunity, a collaboration between Cotton Seed Distributors (CSD) and Bayer Crop Science, with contributions from Cotton Australia, the Cotton Research & Development Corporation (CRDC), the Department of Agriculture & Fisheries, Queensland (DAF) and AgEcon.

“Three cyclones and high rainfall during December to February in Far North Qld has made cotton establishment very challenging this season.

In the March 2024 issue, we highlight the critical period of establishment to flowering and discuss some of the key watchouts for growers”.



WATERLOGGING

Recent high rainfall events across most of Far North QLD has seen many cotton crops inundated with water and experiencing prolonged periods of overcast weather. The timing of the event has coincided with cotton planting up to the squaring stage where the plant is particularly susceptible to the effects of water logging. Waterlogging is a complex stress as it affects both the soil environment and crop growth.



The major and immediate effect of waterlogging is blocking transfer of oxygen between the roots and the soil atmosphere. Plant roots may become so oxygen deficient that they cannot respire. Consequently, root growth and absorption of nutrients is decreased leading to less overall plant growth.

Nitrogen

Denitrification of soil mineral N, may result in less N being available to crop even after water logging has ceased. Foliar N is more effective in increasing the yields of waterlogged cotton when applied one day before irrigation under hot, sunny conditions. Application to a field that is waterlogged will not necessarily alleviate existing damage.

CROP IRRIGATION REGIMES

Be prepared to react and change your strategy when the weather changes and take the time to consider where your plant's development is at and what is going on in your soil profile when making irrigation decisions.

Following the wet season and depending on your soil type, your crop's roots may be a metre deep or confined to the top 20 cm of soil. You need to explore where your crop's root system is at so that you can plan your approach to irrigation time post-wet season, accordingly. Shallower root systems mean that the time between irrigations maybe shorter, even not long after rainfall events.

If your crop is young (vegetative or very early squaring) and conditions have turned dry, use this opportunity to encourage your crop to explore the profile. The aim here is to ensure that irrigation is applied at the optimum time and not early. Applying at the optimal time will encourage better root exploration. Stressing the crop will not necessarily lead to better crop outcomes.

Contributing to this, crops with large canopies and small root systems are susceptible to premature cut out if mismanaged during the transition from wetter to drier conditions so it is vital that a clear understanding of the crop during this time is gained.

MONITORING THE CROP

Critical aspects which your agronomist/consultant can assist with are growth rates, plant height management and fruit retention.

Flowering

Flowering is a critical period of crop development, as this is where the yield potential of your crop is established. The length of the flowering period, conditions and stresses encountered during this flowering window will determine the production and retention of bolls, and the fibre quality.

Preventing Premature/Early Cutout

The period from flowering to cut out is when boll numbers are set defining the potential yield. So, ensuring that the plant/crop grows actively, healthy and with minimal stress through this period is paramount.

As a general principle, higher yields are achieved through a prolongment of the flowering period provided bolls and squares are not being shed due to cloudiness or other environmental factors. Generally, it is more challenging to keep a crop flowering for longer than it is to curtail it as continued growth requires good environmental conditions and adequate nutrition and soil moisture. Terminating the flowering of a crop on the other hand can be readily achieved by limiting inputs (e.g. irrigation) or more commonly applying mepiquat chloride, a growth regulator.

As a general rule of thumb, it is preferable to have a crop's Nodes Above White Flower commence at 7-10 during early flowering as once bolls begin to be set this measure will decrease until cutout (approx. four NAWF) occurs. Just like a long jumper needs a run up before launching off the pad, starting flowering with a higher number of NAWF provides the potential for a longer flowering period and opportunity for more set bolls. The rate of change for NAWF during flowering will vary depending on seasonal conditions, crop inputs and temperature via day degree accumulation.

For further information CSD's **STEFF** (Simulated Time to Estimated First Flower) is a useful tool to help you estimate the date of first flower.



CottonTracka® is another great CSD tool that can be utilised to monitor fruitload and NAWF and thus optimise your crops performance.



INDUSTRY INSIGHTS

DISEASE PATHOGENS

Wet and humid weather is usually a significant factor in disease development. There are several leaf pathogens than can infect cotton causing leaf spots, and in some circumstances premature defoliation.

These leaf spots are caused by a complex of pathogens including *Alternaria* and *cercospora* pathogens. Lesions can develop in a temperature range of 20-30°C. However, lower temperatures within that range are more favourable for infection.

PEST CONTROL

While there are numerous products registered for the control of various cotton pests; many insecticides, if used at the wrong time, can cause more problems than they solve by disrupting the balance of natural pest enemies ('beneficials'). This can subsequently flare secondary pests, which may then require further, often harsher methods of control.

It is particularly important to avoid the use of broad spectrum non-selective products where possible. In the past, repetitive application of **dimethoate** at various locations in Northern Australia has resulted in cotton-melon aphid outbreaks during boll opening.

Several seasons of testing have revealed **catastrophic levels of resistance to organophosphate insecticides in cotton-melon aphids in Western Australia and North Queensland**. The cotton-melon aphid, *Aphis gossypii* Glover, has a wide host range and the levels of resistance present are likely the result of long-term usage of these products across various crops. Where possible, use the most targeted insecticide you can afford, particularly between emergence and crop cut-out.

COTTON HARLEQUIN BUGS

By Paul Grundy, Principal Research Scientist, Crop Protection and Farming Systems, Department of Agriculture and Fisheries

The focus of cotton research being undertaken is to develop management tactics for key pests, disease and canopy architecture to better balance crop protection and climate constraints with crop yield in humid regions. This will involve local validation of canopy management practices, characterisation and potential management of disease pathogens, and development of economic control thresholds for key sucking pests.

For southern regions, harlequin bugs are rarely a pest, but they are frequently encountered in Northern Queensland crops.

What Are Harlequin Bugs?

Harlequin bugs are unmissable in cotton, being large (15-20 mm) orange-coloured stinkbugs that may or may not have peacock-blue coloured splotches. They are often

INDUSTRY INSIGHTS

observed sunning themselves in the upper canopy. After laying eggs, the females guard them to protect them from natural enemies until they hatch after which the adult moves on. During this time, they do not feed. Due to this behaviour and their large size, harlequin bugs are a relatively slow developing pest. Adults will migrate into the crop, mate and lay eggs that take approximately a fortnight to hatch. The first instars do not feed but after the first moult, they begin plant feeding and are likely to be aggregated in groups. As they progress to the later nymph stages, they disperse and become more damaging feeding on developing bolls.

At What Point Should Control Be Taken?

They can feed on developing bolls, causing damage and subsequent yield loss. As these pests are not common in southern cotton, threshold guidelines were derived from glasshouse and cage studies that sought to compare the damage they might cause with a more frequent and better understood pest - green vegetable bugs. These tests found that harlequin bugs cause one quarter of the damage that green vegetable bugs might cause.



As the crop matures and lower canopy bolls open the crop will cease being susceptible. Bolls that are 25 days old will be mostly immune to damage. Therefore, the need to control should cease at about a month after cutout. Harlequin bugs likely to be encountered around field edges compared to the middle. This insect typically poses more problems in smaller or narrow fields compared to much larger management units. An additional consideration is that feeding by these pests can create entry sites for later boll rot pathogens under rainy or humid conditions. This is more likely to be of concern in the table lands regions of north Queensland where rainfall may still occur during May, coinciding with later boll filling and boll opening.

What Options Are Available For Control?

Unfortunately, there are no genuine soft options available for control of these species, and in the case of harlequin bugs there are no specific registrations. A number of neonicotinoid products registered for green vegetable bugs will provide effective incidental control. **Avoid the**

use of dimethoate or pyrethroids as this will likely cause subsequent outbreaks of aphids or mealybugs. If you find yourself needing to make a control decision refer to the [**2023-24 Cotton Pest Management Guide**](#)

FALL ARMYWORM UPDATE

Fall armyworm (*Spodoptera frugiperda*) has swept across sorghum and maize crops throughout Queensland, with the state experiencing severe pest pressure.

Queensland Department of Agriculture and Fisheries (DAF) principal entomologist Melina Miles said it was the most damaging season since 2020.

“This year it’s very widespread,” Dr Miles said. “Every sorghum and maize-growing region in Queensland from the Atherton Tablelands through the Burdekin, down into central Queensland through the Burnett, the Darling Downs, and then into northern New South Wales. “I’ve had reports from all of these regions with quite severe infestations for the most part.”

Dr Miles said the increase in pest numbers could be attributed to a later-than-usual sorghum planting due to late rain, pushing the plants into a period of higher FAW activity.

She said it was also possible that the weather systems associated with the recent cyclones had facilitated the movement of large FAW populations into central Queensland.

Dr Miles urged growers to be alert but not alarmed and take a considered approach to making decisions about the need for control.

For further information
About identification and registered
chemical control options, growers should
contact their local advisers and visit the
[**GRDC Fall armyworm page.**](#)

On the current status of Fall armyworm can
be found on [**The Beatsheet.**](#)



DATE SAVERS – FAR NORTH QLD

APRIL
14

Time: COB
Location: FNQ

**FASTSTART COTTON
ESTABLISHMENT AWARDS
INCENTIVE CLOSING DATE**

**DETAILS
HERE**

APRIL
19

Time:
8 am–3.30 pm
Location:
Tablelands

**FNQ SUSTAINABLE
CROPPING INC.
2024 CROPPING CONVOY**

MAY
1

Time: TBC
Location:
Julia Creek

**BAYER *XTENDFLEX
APPLICATOR TRAINING**

**DETAILS
HERE**

MAY
8-9

Location:
Cairns
Convention
Centre

**PBRI SYMPOSIUM, A
SHOWCASE OF PLANT
BIOSECURITY RESEARCH,
DEVELOPMENT, AND
EXTENSION (RD&E)**

**DETAILS
HERE**

MAY
16

Time: TBC
Location:
Proserpine

**BAYER *XTENDFLEX
APPLICATOR TRAINING**

**DETAILS
HERE**

MAY
23

Time: 3-5 pm
Location:
Dimbulah

**CSD FIELD DAY
DIMBULAH**

**DETAILS
HERE**

MAY
24

Time: 8-10 am
Location: FNQ

**AGRONOMIST WORKSHOP
COTTON PHYSIOLOGY, IPM
& DISEASE MANAGEMENT
FOR THE TROPICS**

CSD Variety Trial – Dimbulah Site, Tablelands



CSD Bollgard® 3 with XtendFlex® Variety Trial Dimbulah – CSX4389B3XF: New germplasm, okra leaf, low density, resistance to cotton bunchy top and has shown broad adaption.
*XtendFlex cotton is not currently commercially available. It will be released commercially once all relevant regulatory approvals are in place

NORTH QUEENSLAND COTTON GRAINS- GRAINS-CATTLE FARMING SYSTEMS

This project aims to initially address the agronomic challenges facing leading farmers then co-develop new farm diversification strategies to grow the industry needed to attract investment.

This brings together a team of leaders in applied crop, cattle and whole farm systems research to work with agri-business, crop and livestock producers to co-develop and adopt appropriate diversification strategies through the six integrated research themes.

1. Cotton Protection
2. Cropping Systems i.e., rotation crops and soils
3. Forage production, feeding systems and cattle production.
4. NRM Stewardship - Sustainability manual
5. Participatory research approaches linked with whole farm scenario simulation analyses.
6. Whole farm Economic analysis of different crop-forage systems in north Queensland



For further information
Visit www.crcna.com.au

THEME 2A. SOIL HYDROLOGY

Update by Grant Cutler
(Research Agronomist; DAF-Mareeba)

An initial desktop survey was carried out to identify FNQ cropping areas and from these an initial 4 sites were selected to quantify baseline soil characteristics and soil hydrology for their inclusion into the APSIM database. A further possible 4 sites were identified for the 24/25 cropping season.



Soil amendments applied pre-plant banded over plant rows prior to shallow surface incorporation.

Soil characterisation for Plant Available Water Content (PAWC) for FNQ cropping soils is required for detailed information on soil-water dynamics. Inclusion into the APSIM database allows not only researchers but also

agronomists and growers the ability to simulate crop performance and can relate potential yields to water and/or nutrient budgets.

Upon investigation at these soil characterisation sites, it has been found that there lies the potential for soil constraints within the varying soil-types found throughout the north. The main potential constraints identified were surface sealing/crusting and subsoil hard setting/compaction.

The fine texture, relatively low clay content and low organic matter of some soils can lead to naturally degraded surface structure which can be exacerbated by tillage resulting in intrinsically poor soil hydrology characteristics such as low infiltration rates.

Currently, there are 2 small-scale field trials evaluating the use of a number of soil amelioration amendments such as gypsum, mill mud, compost etc on soil surface hydrology characteristics such as soil strength/penetration resistance and soil crust thickness.

Additional work will aim to be carried out to properly identify the causes of the subsoil hard setting/compaction. Is it the result of compaction from traffic, the result of natural soil chemical/physical characteristics or a combination of both?



Soil surface crusting in cotton crop effecting germination and establishment.

Outlined activities for 2024

- Small-scale trials evaluating soil amendment options looking at soil surface crusting amelioration
- Investigation into subsoil constraints; namely subsurface hard setting/compaction issues
- Demonstration trial of potential subsoil constraint amelioration

Monitoring field crop lower-limits and soil PAWC upper-limits at APSIM soil characterisation sites

THEME 1. COTTON CROP PROTECTION

Update by Samuel Krekeler
(DAF-Mareeba)

Leaf samples from crops exhibiting disease symptoms have been collected across North Queensland during the previous and current cropping season and analysed in

CRCNA PROJECT UPDATE

the laboratory utilising spore morphology. Leaf spots that have been universally referred to as *Alternaria* were found to be a complex of pathogens including *Alternaria* sp., *Cercospora* sp., and *Stemphylium* sp.

This disease complex also occurs in other tropical cotton growing regions such as the southeastern United States. The outbreak of these disease-causing pathogens may be associated with potassium deficiency which can explain why leaf symptoms worsen during boll setting and fill as the plant remobilizes potassium from the leaves to the fruit. Lesions can develop in a temperature range of 20–30°C. However, lower temperatures within that range are more favourable for infection, and although wet weather (rain splash) and wind are generally favourable for spore dispersal, severe outbreaks have been observed in dry weather conditions. The phenological stage of the crop (i.e., flowering) is also believed to play a role in disease development.

The influence of potassium fertilisation on disease incidence and severity will be tested on these pathogens in the 2024 season.

Fungicides may also have a role for the management of foliar diseases of cotton. Several fungicides are being tested this season with the purpose of identifying compounds that might provide effective disease control.

Insecticides for managing key boll-sucking pests are also being assessed in the 2024 season. An initial trial in 2023 tested the efficacy of insecticides registered in cotton for green vegetable bug control together with a new product from Syngenta for the control of Red-banded Shield Bug (*Piezodorus hybneri*). This species has been difficult to control in cotton and pulse crops. Initial results were promising, and testing will be continued in the current season on a range of target species, namely the Cotton Harlequin Bug (*Tectocoris diophthalmus*), Cotton Stainers (*Dysdercus* spp.) and Red-Banded Shield Bug.



Infected leaf under the microscope, showing the diversity of pathogens present in one lesion: *Alternaria* sp., *Stemphylium* sp., and *Cercospora* sp.

The aim of this research is to ultimately work with registrants to expand insecticide options available to growers for sucking bug control. Options for sucking bug management are limited and newer products may have an improved IPM fit.

Additionally, the impact of cotton stainer and harlequin bug feeding in cotton will be examined in greater detail to understand better the risk of crop damage and if required, when it would be best to control them.



Cotton Harlequin bugs in action: 3rd instar (left) and adults (right).

Outlined activities for 2024

- Field-efficacy trials screening fungicidal actives for the control of foliar diseases of cotton.
- Testing the effect of potassium fertiliser on leaf disease suppression.
- Surveillance to characterise and diagnose pathogenic organisms causing foliar disease in North Queensland.
- Field-efficacy trials testing new and existing chemistry against key boll-sucking pests.
- Threshold experiments to measure impact of Cotton Harlequin Bugs and Cotton Stainers.
- Demonstration of recently developed cotton canopy management practices demonstrated on farm for extension purposes in the 2024 season.



For further information

Visit www.crcna.com.au



Cotton Stainers (*Dysdercus* spp.)

Project Partners Include: UQ, DAF, CQU, Gulf Savannah NRM, Radicle Seeds, Agrimix, CRDC, GRDC & CSD

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A wealth of cotton industry information is just a few clicks away, covering everything including varieties, technology, agronomy, policy, advocacy, and much more. We encourage all growers to subscribe to industry updates and publications to help you stay in the loop with the latest information and opportunities within our industry.



COTTON SEED DISTRIBUTORS LTD (CSD)


CSD is a major investor in cotton breeding, research and development, having developed a long and successful partnership with the CSIRO cotton breeding program. CSD's objective is to deliver elite varieties that are bred and adapted to suit local growing conditions by delivering yield and quality outcomes. CSD Members have access to a wide range of updates and technical information.

 To learn more and apply for CSD membership visit [CSD's website](#).



COTTON AUSTRALIA

Cotton Australia is the peak representative body for the Australian cotton growing industry. It determines and drives the industry's strategic direction, with a strong focus on R&D, promoting the value of the industry, reporting on environmental credibility and implementing policy objectives in consultation with stakeholders.

 You can learn more and subscribe to updates by visiting the [contact page](#) of the Cotton Australia website.



CRDC


The Cotton Research and Development Corporation (CRDC) delivers outcomes in cotton research, development and extension for the industry. A partnership between the Commonwealth Government and the Australian cotton industry, CRDC exists to enhance the performance of the industry through investment in, and delivery of, RD&E: helping to increase the productivity and profitability of growers. CRDC publishes a quarterly magazine called Spotlight and co-publishes major publications such as the Pest Management Guide and Cotton Production Manual.

 Subscribe to any or all of the CRDC and CottonInfo publications [here](#).



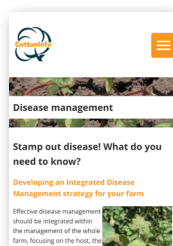
COTTONINFO

CottonInfo is the Australian cotton industry's joint extension program and is a joint venture from CRDC, Cotton Australia, and CSD. CottonInfo connects growers with research, bringing you the latest news, information, events and research, and helping you achieve best practice. You can subscribe to CottonInfo's weekly emails and weather monitoring service, as well as ensuring you receive publications such as the Pest Guide and Production Manual.


 You can also access northern specific information such as analysis of gross margin [budget scenarios](#).

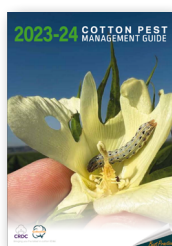


RESOURCES




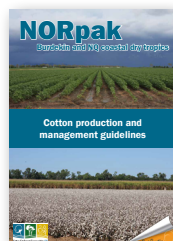
Stamp out disease! What do you need to know?

 Access disease management information and resources via the CottonInfo website [here](#).



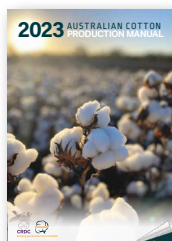
COTTON PEST MANAGEMENT GUIDE 2023-24

 Access this publication [here](#).



NORPAK: Cotton Production and Management Guidelines for the Burdekin

 Access this publication [here](#).




AUSTRALIAN COTTON PRODUCTION MANUAL LATEST EDITION: CRDC

 Access this publication [here](#).




TROPICAL COTTON PRODUCTION: Considerations for Northern Growers

 Access this publication [here](#).




COTTONINFO: Rotational Tool

 Access this tool [here](#).



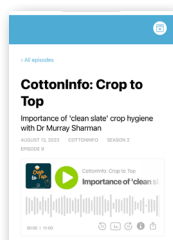
GROWING COTTON IN NORTHERN AUSTRALIA: Grower Guide

 Access this publication [here](#).




CSD COTTON YARNS: Dr Kristen Knight – Bollgard® 3 RMP

 Access this podcast [here](#).



IMPORTANCE OF 'CLEAN SLATE' CROP HYGIENE: with Dr Murray Sharman

 Access this podcast [here](#).




CSD COTTON YARNS: Northern Australia Update


 Access this podcast [here](#).

TOOLS


Cotton Field Weather Network, Dimbulah, Qld Site

 Access the tools [here](#).


Cotton Field Weather Network, Forty Mile Site

 Access the tools [here](#).


Cotton Field Weather Network, Mutchilba, Qld Site

 Access the tools [here](#).


CottonTracka Real Time Data

 Access the tools [here](#).

Day Degrees

 Access the tools [here](#).

Stimulated Time to First Flower (STEFF)

 Access the tools [here](#).

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