



NORTHERN NEWSLETTER

ESTABLISHMENT TO FLOWERING

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

Pest control

Cotton can be damaged by a range of insect pests during the season. Employing an experienced crop consultant/agronomist to regularly monitor the crop and help you make pest management decisions is crucial for timely control of these pests.

DOZEN DEEDS FOR NORTHERN AUSTRALIA

Rule 1. Planning, preparation and stewardship Engage a cotton agronomist/consultant

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 usage 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 aphid outbreaks during boll opening. Resistance testing of these aphids last season revealed extreme levels of resistance to organophosphate insecticides which explains this outcome. The levels of resistance present are likely the result of long-term usage of these products for vegetable production where cotton aphids are a regular pest. Where possible, use the most selective insecticide you can afford, particularly between emergence and crop cut-out.

The exotic pest, fall armyworm (*Spodoptera frugiperda*) has recently been detected for the first time in Australia. While Bollgard® 3 is not registered for the control of *Spodoptera spp.*, it is expected that there would be a degree of incidental suppression based on observations

in other countries and with similar Bt endotoxins used for successful control in transgenic maize.

For further information on pest management in cotton:

- Cotton Pest Management Guide: www.cottoninfo.com.au/publications/cotton-pest-management-guide
- Pests and Beneficials in Australian Cotton Landscapes: www.cottoninfo.com.au/publications/pests-and-beneficials-australian-cotton-landscapes

Recent inspections of cotton crops near Mareeba in Northern Queensland found no evidence of fall armyworm activity in either Bollgard 3 or unsprayed conventional cotton refuges. The native *Spodoptera litura* and *Helicoverpa armigera* were very abundant in refuges. Inspection of corn and sorghum crops in the region and also in the Burdekin have found widespread fall armyworm activity. The absence of fall armyworm in cotton at this stage, despite widespread abundance within corn crops in the same district, suggests that cotton may not be a preferred host.

Beneficials including parasitoids have been found affecting fall armyworm, emphasising the importance of limiting number of sprays and selecting the most selective insecticide where possible.

The industry needs to be on the lookout for any incursions of exotic pests, insects, weeds, diseases and pathogens. Please report anything suspicious to your local relevant biosecurity authority, for testing and identification.

For current information on fall armyworm in Australia:

- Biosecurity Queensland: www.daf.qld.gov.au/business-priorities/biosecurity
- CottonInfo Insect ID Guide: From endemics to exotics: www.cottoninfo.com.au/publications/insect-id-guide-endemics-exotics

Disease pathogens

A disease occurs when a pathogen is exposed to a susceptible host variety and the environment is favourable for an infection to take place. A disease can be controlled by excluding or eliminating the pathogen, growing a resistant variety or by modifying the environment.

If pathogens aren't present in an area, don't introduce them! Always practice good farm hygiene and insist that vehicles, machinery and equipment - even your boots - are clean before moving on or off farm: Remember to *"be a good mate and leave it at the gate"*.

All cotton seed in Australia is supplied with a standard fungicide seed treatment for the control of seedling diseases. The seed also undergoes a rigorous process to ensure that disease cannot be transmitted on the seed.

Wet and humid weather is usually a significant factor in disease development. There are several leaf pathogens than can infect cotton and cause various leaf spots, and even defoliation, when a crop is exposed to an extended period of wet weather.

The most common of these observed in Northern Australia is Alternaria leaf blight. This disease is rarely a problem for healthy crops but can cause significant leaf damage in later planted crops which are exposed to cool overnight temperatures and dewy conditions. The simplest way to avoid this disease is to ensure that peak boll load occurs during autumn as opposed to mid-winter. Alternaria caused significant yield loss for dry season crops in research trials at Katherine and in the Burdekin during the mid-2000's. Alternaria may also be present during the wet season, but damage has tended to be limited to the lower canopy, with senesced leaves rapidly replaced at this time of year.

DOZEN DEEDS FOR NORTHERN AUSTRALIA Rule 7. Have a plan for weed control

Weed control

It is important to control weeds, in order to reduce competition for the crop and maximise yield potential. There are a number of tools available to manage weeds during a cotton season.

The cotton plant can also become a weed itself, if not controlled properly following harvest. It is essential to control both volunteer and ratoon cotton before, during and after the cotton season, as part of the Bollgard® 3 Resistance Management Plan (RMP) and also for general farm hygiene. Volunteer and ratoon plants can harbour unwanted pests and become very difficult to control if not acted on when they are small.

The Roundup Ready Flex® Weed Resistance Management

Plan details strategies that can be implemented to minimise the risk of glyphosate resistance developing in weeds on-farm.

For more details visit www.bollgard3.com.au and download the Roundup Ready Flex Weed Resistance Management Plan (WRMP).

Consult the Roundup Ready Flex Cotton Weed Management Guide (WMG) for clear recommendations for weed control practices in a Roundup Ready Flex cotton crop. The guide includes a range of herbicides which offer different modes of action throughout the season, reducing the risk of glyphosate resistance developing on your farm and saving you time and money in the future.

A key part of the RMP for growers of Bollgard 3 cotton is the control of volunteer and ratoon cotton.

It's important to act on early season weeds (including cotton volunteers) when they are small, and ensure cotton is fully destroyed post-harvest as it can become a woody weed (ratoon). It is also important to implement appropriate cultural methods and herbicide strategies to control volunteer cotton.

For more details, visit www.bollgard3.com.au and download the Control of volunteer and ratoon cotton guide.

DOZEN DEEDS FOR NORTHERN AUSTRALIA Rule 9. Monitor to manage the crop

Monitoring the crop

Utilise your consultant/agronomist to monitor crop growth and progress, as well as insect pests and disease, and to prescribe methods of control, if required. A consultant/agronomist can provide a fresh set of eyes and will also have an understanding of where the crop should be up to based on their knowledge of other crops in the district. Critical aspects which your consultant can assist with are growth rates, plant height management and fruit retention.

Cotton is a responsive crop to manage, hence growers are able to monitor and manipulate the plant for ease of management and to maximise yield. The rate of growth of a cotton crop is determined by temperature, sunlight and soil moisture. Depending on these variables; in particular temperature, the crop will follow a specific growth pattern.

This predictability allows for management and monitoring to influence crop growth and development. Using the relationship between the rate of development and temperature, a measure of crop progress is described as

Day Degrees. Certain crop milestones are likely to occur relevant to the number of Day Degrees accumulated throughout the season.

Plant growth regulators

Excessive growth can lead to reduced penetration of insecticides, as well as a reduction in sunlight penetration into the crop canopy that can reduce the expression of Bt toxins and exacerbate boll shedding. However, the use of growth regulators must achieve a balance between suppressing vigorous early growth and not subsequently inhibiting the production of later fruit if required for yield compensation.

Mepiquat chloride (Pix®) recommendations from temperate Australia based on internode length **DO NOT WORK** in tropical production systems. Yield reductions of up to 26% in wet and 16% in dry seasons occur when excessive Pix application prevents plant recovery from environmental stresses.

Local R&D has developed and validated crop monitoring systems based on maintaining an optimum height range relative to the overall height, node number and crop boll load as the crop develops by only using low rates of Pix (repeat dosages of 200-400 mL/ha when required) and/or other management (e.g. irrigation). The approach is to moderate growth over time, leaving room to change tactics should the weather or other factors post-application work against you. Once applied Pix will have an effect on the crop for approximately 10 days after application and therefore once applied it cannot be removed. During the transition from wet to dry season conditions it can be difficult to predict field conditions more than several days ahead and therefore it is prudent to make repeat applications of Pix at a lower rate if required than use a larger one-off dose. The impact of Pix can be excessive if the weather changes from wet and overcast to sunny and hot. Also keep in mind that Pix may also reduce root system expansion.

Refer to NORpak for further information on plant growth regulation in Northern Australia: www.cottoninfo.com.au/tropical-cotton-production

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. It is unlikely two seasons will be the same.

Determine how deep your root system is. Following the wet season and depending on your soil type, your crops roots may be a metre deep or confined to the top 20 cm of soil. As this will vary between seasons, you need to explore where your crop's root system is at so that you can plan your approach post-wet season, accordingly.

Crop stage - 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 crop is very resilient to water stress at this time and a break in the wet weather during this period can allow for better root exploration. Alternatively, if your crop is about to commence flowering or is flowering and it has been subjected to wet conditions and has a shallow root system, be prepared to irrigate early, soon after rainfall. Crops with large canopies and small root systems are susceptible to premature cut out if mismanaged during the transition from wetter to drier conditions. It may be necessary to irrigate these crops within a week of last rainfall.



INDUSTRY PROGRAMS

The Roundup Ready PLUS® Program

The Roundup Ready PLUS program is designed to reward cotton growers who use herbicides sustainably and help slow or prevent development of glyphosate resistance in key weed species. The program encourages growers to use a range of weed control practices through product recommendations, education and stewardship campaigns and financial rebates.

Record herbicide usage for rebate by April 30.

Terms and conditions apply. For further information, visit: www.roundupreadyplus.com.au.



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FOR MORE INFORMATION

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RESOURCES AND TOOLS

Resources

- [NORpak: Cotton Production and Management Guidelines](#)
- [Tropical Cotton Production: Considerations for Northern Growers](#)
- [Growing Cotton in Northern Australia, Grower Guide](#)
- [Acres of Opportunity Irrigated Cotton Guide](#)
- [Acres of Opportunity Dryland Cotton Guide](#)
- [2019 CSD Grower Information Guide](#)
- [Australian Cotton Production Manual](#)
- [CSD Variety Guide](#)
- [CSD Variety Trial data \(no local trial data for Northern Australia currently, but there will be next season\)](#)
- [FastStart™ website](#)
- [Bollgard 3 Northern Resistance Management Plan \(RMP\)](#)
- [Planting Windows in Northern Australia: Quick Guide](#)
- [The Dozen Deeds for Northern Australia](#)

Tools

- [Cotton Field Weather Network](#)
- [Canopy Temperature Network](#)



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