



Information when you need it



Darling Downs

February 2020

**Welcome to the
January/February Edition**

Meet your cotton researcher – Dr
Alison McCarthy, Mechatronic
Engineer, Centre for Agricultural Engineering, USQ, Toowoomba



How did you end up in Cotton Research: I became involved in cotton research during my PhD on optimising irrigation using real-time adaptive control funded by the Australian Research Council and CRDC. Following this CRDC funded my postdoctoral scholarship and research projects in irrigation automation and sensing tools for insect management

What excites you about working in the Cotton Industry? The Australian cotton industry is innovative in their uptake and research support of cutting edge technologies that optimise efficiency and management practices.

What are your current research projects?

1. Development and evaluation of methods for monitoring and control of irrigation for optimum productivity (Alison McCarthy (USQ), Joseph Foley (USQ) and Malcolm Gillies (USQ))
2. Machine vision App for automated cotton insect counting (Alison McCarthy (USQ), Derek Long (USQ), Paul Grundy (QDAF))



How will they benefit the grower?

1. Provide sensors and software tools that improve precision of irrigation application to meet water requirements, reach yield potential over whole field and improve water productivity.
2. Improved time efficiency in sampling for insects, standardise pest counting between different observers, improve chemical control decisions, and provide a convenient method for logging and viewing data for each field

How will it benefit the industry?

1. Optimisation of water use will aid industry to hit WUE targets, demonstrate improved water management benefiting industry social licence when being scrutinised for water use.
2. Automation of pest counting process for improved pest control decisions and potentially Area Wide Management.

What are your key findings to date?

1. Using in-season crop sensing for irrigation decisions in cotton has led to 6% extra yield and 14% more efficient water use than existing soil sensing approaches. In-season yield prediction that can help plan irrigation management has been demonstrated with errors of 10.2%-18.8%, 4.9%-8.7%, 2.5%-9.5% and 0.5%-10.1% at four, three, two and one month before harvest.
2. Initial image analysis techniques for SLW nymphs have shown 79% accuracy. This will be refined and techniques expanded to other pests (aphids and mites) with App developed for preliminary field testing by agronomists in the 2019/20 season.

Thanks Alison. For more information Alison McCarthy E. alison.mcarthy@usq.edu.au P. 07 4631 2189

Silverleaf Whitefly Management Update

Silverleaf Whitefly (SLW) are starting to occur in crops in the Gwydir. While numbers are still very low, now is a good time to think about your management options over the coming six weeks:

- The 30-day application window still applies for the use of Pyriproxyfen (eg. Admiral®).
- Pyriproxyfen windows for the Darling Downs is Central Downs (28 Jan – 28 Feb), Chinchilla, Brigalow, Tara (20 Jan-20 Feb, Murgon, Byee (10 Feb- 10 March).
- There is a new restriction of just 1 spray per season for spirotetramat (Movento®).
- Conserve natural enemies and the *Eretmocerus* SLW parasitoid with good Integrated Pest Management (IPM). This can be as simple as avoiding unnecessary sprays for mirids and if you do need to spray use the most selective option you can afford. Refer to Table 3 pages 10-11 in the CPMG for the impact of various insecticides on beneficial insects and bees [Cotton Pest Management Guide](#).
- Keep an eye out for nymphs and adult SLW as the crop moves towards peak flower.
- The SLW decision matrix for control is undergoing review as it does not always accurately predict changes in population. Research will soon be complete that will underpin updated guidelines. In the interim, as crops

approach cut-out pay particular attention to SLW numbers. Both nymphs and adults can be used to determine abundance. The key is to identify if populations are increasing from week to week. If they are increasing and the crop is approaching cutout, consider your control options.

- When deciding on control, keep in mind – The time until first open bolls, level of honey dew, nature of population (is it rapidly rising or increasing a little each week), insecticide mode of action and resistance considerations. Products such as Admiral require at least 2 weeks to work and will perform better on a more open canopy.
- Products such as Pyriproxyfen (eg. Admiral®) are best targeted with a rapidly rising population when your crop is 2-3 weeks away from first open boll.
- As the performance of Pyriproxyfen also depends on adequate spray coverage, targeting your application prior to canopy row closure may also be beneficial.
- Review the top tips for Pyriproxyfen use for mid-season management of SLW [here](#).
- Spirotetramat (Movento®) is a good option if you have a large crop as its systemic action can help you target nymphs in the lower canopy (remember, that this product can only be used once per season as it is very prone to resistance if misused).
- Once bolls have begun to open shift your focus onto preventing honey dew contamination of the bolls. This may entail a follow up application for some crops following earlier intervention with an IGR. When selecting an option for cotton with open bolls, consider the canopy health and time to defoliation and leaf drop. A knockdown style product may be appropriate within 1-2 weeks of defoliation. On a crop with further to go with a healthy canopy, a product such as Movento with its systemic action may be more appropriate.
- A demonstration of sampling techniques and other SLW management related videos can be found on the CottonInfo YouTube channel, in the Insect management section:
 - [SLW in cotton: sampling and the SLW threshold matrix](#)
 - [Identifying parasitism in SLW](#)
 - [SLW in Cotton: When population increases don't match the matrix](#)

On-farm biosecurity survey: attitudes, motivations and barriers – we need your help!? **MORE SURVEY PARTICIPANTS REQUIRED. It only takes 5 minutes to complete.**

Queensland Department of Agriculture and Fisheries and CottonInfo are currently undertaking a survey to gain a better understanding of grower, agronomist and industry member attitudes and perspectives towards on-farm biosecurity, motivations for implementing on-farm biosecurity practice and barriers to implementing on-farm biosecurity within the Australian cotton industry.

The survey is for those working across the Australian cotton industry including growers, agronomists and industry members. **The survey consists of 8 short questions – all are multiple choice – and will take less than 5 minutes to complete.** Only the research team will have access to the survey results with data aggregated to further assure confidentiality and anonymity.

Your assistance with completing the survey is much appreciated. To complete the survey, please click the following link: <https://www.surveymonkey.com/r/RV6QPFM>

For questions or concerns please contact Sharna Holman, CottonInfo Biosecurity Technical Lead on sharna.holman@daf.qld.gov.au or 0477 394 116

Farm Biosecurity Sign Update?

Amendments to legislation has meant an update to farm biosecurity signs for Qld and NSW farmers. Amendments were made in Queensland to address potential biosecurity risks where animals are kept, so noting this is of interest to mixed farming properties. Similar to NSW, signs and plans must be updated to refer to the Biosecurity Management Plan and Biosecurity Act, to ensure that the legislation is able to be enforced. In Queensland, you can use this template to show you have a biosecurity management plan:
<https://www.publications.qld.gov.au/dataset/biosecurity-planning/resource/3e916f83-4dd3-4b68-ac2e-54e267e97533>

For those interested in finding out more they can head to the QLD Biosecurity website:
<https://www.daf.qld.gov.au/business-priorities/biosecurity/policy-legislation-regulation/biosecurity-planning>

Herbicide Resistance Testing



The free herbicide resistance testing program is available to all growers who have grown Roundup Ready Flex[®] cotton in any of the prior 3 seasons. Growers can test key weeds present in cotton systems for resistance to program herbicides. To test resistance, growers need to follow these steps.

1. Bayer have pre-printed testing envelopes that can be used for weed seed collection. Please contact your Bayer Regional Business Manager, or email cotton@monsanto.com.
2. Samples will be sent to Plant Science Consulting, who will do the testing and provide results directly to the grower.



CSD Ambassador Update (19 Feb 2020) – Darling Downs

Larissa Holland – CSD Agronomist has provided us with an update on how the CSD Ambassador sites are going to date this season.

10 Trials on the Downs	Average	Range
First Flower Date	13/01/2020	28/12/19 - 30/1/2020
DD base 12	1007	909 - 1099
DD 1532	625	
Days till FF	70	63 - 79
Total Nodes	18.3	16-20
Square Nodes	10.5	8 to 13
1st Position retention	87.6	80 -90%
NAWF	9.4	8 to 10
Plant Height	55.2	40-65
Avg Temp	26.4	25 -28
Cold shocks	6	0-9

- The first flower snapshot shows that number of vegetative nodes higher than previous seasons reflecting a hard start to the season where the plant did not initiate flowering
- Number of cold shock days coupled with windy conditions in plants early life delayed onset of flowering
- NAWF did not appear to be impacted however with some crops having a NAWF as high as 10 at FF
- Plant heights at first flower reflect dry conditions with some crops only being 40 cm tall at first flower. Recent rain however has seen this improve dramatically as plant now has resources to grow. Some plants over 1m tall towards end of flowering period.
- First flower timing spanned the whole month of January some crops were able to benefit from the rain that started to fall mid-January
- Early season retention was on target through January but the number of cloudy days has seen some square shedding
- NAWF throughout flowering a mixed bag. Some crops were not able to benefit from the rain as much as others and were close to cut out by the timing of the first major rain while others have been able to flower for well over a month and are still growing on.
- Also some boll rot noticed low on plant but not wide spread



2020 CottonInfo Calendar

2020 is the UN's International Year of Plant Health, so each month this year, the CottonInfo Technical Lead for Biosecurity, Sharna Holman, will be bringing you her top tips for your plant health.



Biosecurity top tips – January. Monitor, manage, report

Exotic plant pests and diseases can reduce yields and profitability, affect our environment or change the way we manage our crops and farms. Being familiar with the pests that represent the greatest risk to the cotton industry is important so that you are able to respond quickly to a suspected exotic pest. Early reporting of a pest incursion provides the greatest chances for successful eradication.

The regular monitoring of crops allows crop managers to do two things:

- 1) Implement appropriate management strategies, taking in considerations of pest thresholds, plant physiology and desired yield outcomes
- 2) Keep an eye out for anything unusual. What's considered 'unusual'? Sightings of anything unusual can include unexpected crop failures, abnormally high mortality rates in plants or sudden and unexplained crop damage or yield loss.

Read the entire CottonInfo Blog [here](#).

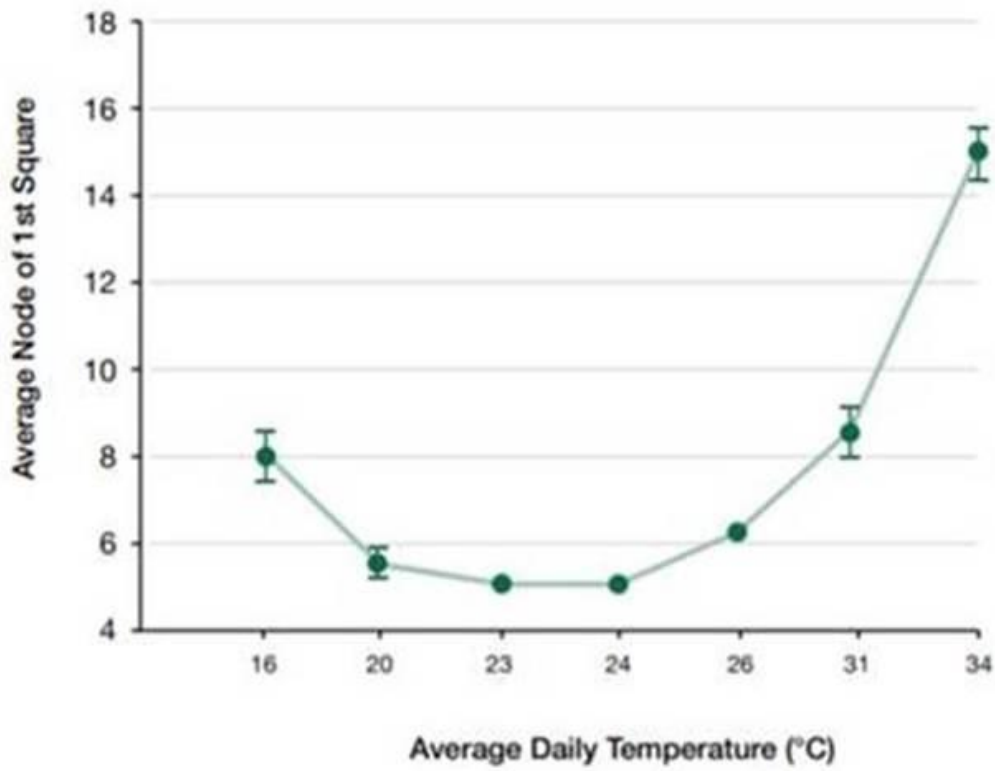
Why differences in nodes to First Fruiting Branch?

Alice Curkpatrick, CSD E&D Agronomist for the Gwydir: "Its temperature driven, so planting date will have an effect. However, it's not a linear relationship, it's a j-curve (see Figure below), a non linear relationship, it can be too hot or too cold. Ambassador data supports the theory that higher Nodes to first fruiting branch (NFFB) can adversely affect yield potential. I have also seen some plants put on a vege branch or two after a fruiting branch, again its temperature driven.

This image and information (sourced Chris Teague E&D Agronomist Border Rivers & Balonne) is of 18-19 node cotton, FFB at 9th node (imbibed 27th Nov = high average temperatures leading up to first square) as you can see it started fruiting then switched to vegetative for 2 nodes and back again to fruiting. It's a consequence of seasonal conditions and how the plant has responded to a potential stress - working back down the plant at roughly 3 to 3.5 days per node will give a rough time scale. However be mindful that the choice of vegetative or fruiting branch is determined at node initiation, consequently this may be an additional week prior, this timeframe may provide some insight to what was influencing the plant at the time when it changed from fruit to vege or vege to fruit.

The figure below shows the time to first square under differing average temperature regimes. The optimal average temperature is between 24 and 28°C. At cooler average temperatures the time required to reach squaring can double if the average temperature is below 20°C. Conversely, high average temperature regimes can also have detrimental effects on the rate of the cotton plant's development. (Bange CSIRO, 2014).





Source: [FastStart Cotton Establishment Guide](#)

What is FAW, and what do you need to look out for?

You may have heard last week that the exotic pest fall armyworm (FAW) *Spodoptera frugiperda* has been detected for the first time in Australia, in the Torres Strait and Northern Queensland.

If you missed it last week, [here's Cotton Australia's news flash re FAW](#).

Cotton Australia, CRDC and CottonInfo are calling for growers to be aware of what the pest looks like and be alert to its presence.

An Insect ID guide to help distinguish FAW from Northern Australian endemic species is available on our [CottonInfo website](#).

The guide was developed by our CottonInfo biosecurity technical lead, Sharna Holman of QLD DAF, with other industry bodies. FAW has a strong resemblance to other species in Northern Australia, so careful inspection is required of any suspect specimens.



February 2020

From Endemics to Exotics

Identifying cluster caterpillar, northern armyworm and fall armyworm

Proper identification is important for knowing if the insect in your field is of economic importance. The correct identification of a pest allows for:

- Appropriate management practices to be implemented, and
- Early identification and detection of potential exotic pests, enabling successful containment and eradication programs.

Key features of a pest throughout its lifecycle can assist with making a correct identification. While a photo is worth a thousand words, ensuring you read the text description of symptoms and visual appearance can help differentiate between similar looking appearances.

If you suspect you have detected fall armyworm, contact the Exotic Plant Pest Hotline.



EXOTIC PLANT PEST HOTLINE
1800 084 881



FAW larvae have a pale yellow inverted 'Y' on forehead.



Male moths have mottled forewings.

Dates for the Diary

- **26th February 2020, Darling Downs, Cotton Grower of the Year Field Day** **POSTPONED TILL 11TH MARCH**
 - 'Cullingral' 1785 Fairymeadow Road, Miles, QLD
 - Breakfast at 7.30am AEST, field day starts 8.15am AEST
 - For catering, RSVP by 24th February 2020 – Mary O'Brien (maryo@cotton.org.au , 0427 358 806) or Annabel Twine (annabel.twine@cottoninfo.net.au, 0447 176 007)
- **Wednesday 25th March 2020, Bayer Cotton Grower of the Year Field Day**
 - 'Fairfield' Boggabilla - hosted by Tom and Charm Arnott

Annabel Twine

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