CottonInfo **Information** *when you need it*

CFI and the Australian Cotton Industry:

Industry Workshops on Nitrogen Use

December 2013

CottonInfo is a joint initiative of Australian Government Cotton Research and Development Corporation, CSD Cotton Seed Distributors, Cotton Australia, Australian Government

This project is supported by funding from the Federal Government

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Background

Nitrogen use workshops form part of the Cotton Research and Development Corporations Extension and Outreach project; “Carbon Farming in the Australian Cotton Industry”.

Agricultural advisory firm Back Paddock Company, in partnership with Cotton Info were contracted to deliver a round of workshops in cotton areas of eastern Australia to assist the CRDC in meeting its extension objectives under the CFI:

- Up-skill cotton & grains industry advisers, extension networks and key influencers about emissions management and nitrogen use in cotton production

The key performance indicator used to measure extension efforts in this area at the conclusion of the project is as follows;

- 75% *of cotton growers and 90% of advisers have an improved Understanding of the CFI, emissions management and sequestration in cotton farming.

- 75% *of cotton growers and 90% of advisers understand how N_2O emissions can be reduced.

- 25% *of industry implementing plant tissue analysis to monitor crop nutrition balances to meet crop nutrient demand.

(As measured by CRDC fund Cotton Grower Practices and Cotton Consultants surveys conducted at the beginning and the end of the project)

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Cotton Growing Areas of Eastern Australia

Figure 1 illustrates the key cotton growing locations of eastern Australia.

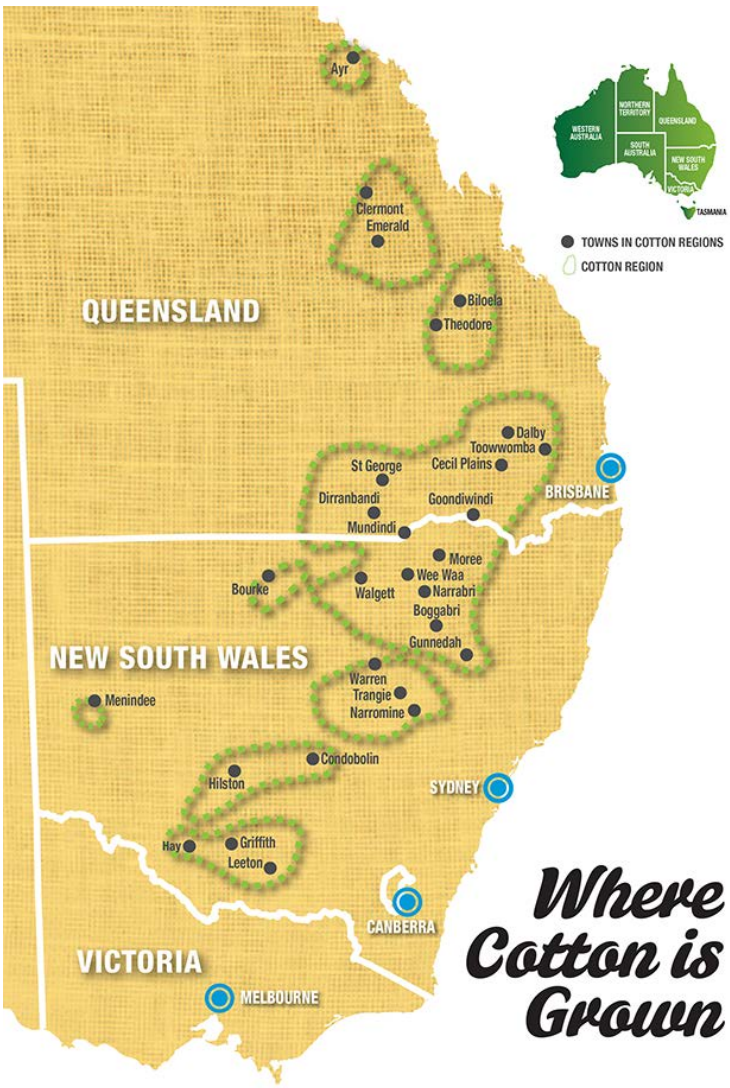

Figure 1 Map of cotton growing areas in eastern Australia

Workshop Summary

Darling Downs West

Date:	2 December, 2013
Location:	Cecil Plains, Q'ld
Cotton Info Lead:	John Smith
Back Paddock Presenter:	Dr Chris Dowling
Attendees:	14 Advisors and Farmers

Figure 2 Dr Chris Dowling, Back Paddock Company with two attendees at the Cecil Plains N Workshop

Darling Downs East

Date:	2 December, 2013
Location:	Dalby, Q'ld
Cotton Info Lead:	John Smith
Back Paddock Presenter:	Dr Chris Dowling
Attendees:	8 Advisors and Farmers

Macquarie Valley

Date:	2 December, 2013
Location:	Warren, NSW
Cotton Info Lead:	Amanda Thomas
Back Paddock Presenter:	David Hall
Attendees:	8 Advisors and Farmers

McIntyre & Border Rivers

Date:	3 December, 2013
Location:	Goondiwindi, Q'ld
Cotton Info Lead:	Sally Dickinson
Back Paddock Presenter:	Dr Chris Dowling
Attendees:	13 Advisors and Farmers

Figure 3 Attendees at the Goondiwindi Nitrogen Use Workshop

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Date:	4 December, 2013
Location:	Boggabilla, NSW
Cotton Info Lead:	Sally Dickinson
Back Paddock Presenter:	Dr Chris Dowling
Attendees:	15 Advisors and Farmers

Figure 4 Attendees at the Boggabilla Nitrogen Use workshops

Namoi Valley

Date:	3 December, 2013
Location:	Burren Junction and Narrabri, NSW
Cotton Info Lead:	Geoff Hunter
Back Paddock Presenter:	David Hall
Attendees:	14 Advisors and Farmers

Gwydir Valley

Date:	5 December, 2013
Location:	Moree, NSW
Cotton Info Lead:	Alice Devlin
Back Paddock Presenter:	David Hall
Attendees:	28 Advisors and Farmers

Lower Balonne

Date:	19 December, 2013
Location:	St George, Q'ld
Cotton Info Lead:	Sally Dickinson
Back Paddock Presenter:	Dr Chris Dowling
Attendees:	11 Advisors and Farmers

Figure 5 Attendees at the St George Nitrogen use workshops

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Riverina

Date:	13 December, 2013
Location:	Griffith, NSW
Cotton Info Lead:	Kieran O'Keefe
Back Paddock Presenter:	David Hall
Attendees:	11 Advisors and Farmers

Post Workshop Survey Results

How much N did you apply this season?

Number of respondents = 72		
<200kg	200 – 250kg	>250kg
6%	28%	66%

How did you apply your N this season?

Number of respondents = 82			
All Pre Plant	Pre Plant/Water run	Pre-Plant/Side dress	Pre-plant/side dress/water run
2%	35%	11%	52%

What is the % split?

Number of respondents = 75				
			Pre-plant/side dress/water run	
80/20	60/40	66/34	66/24/10	50/25/25
15%	21%	12%	28%	24%

List 2 key management techniques to help reduce denitrification?

Number of respondents = 56		
Irrigation management	Deep placement	Inhibitors
68%	28%	4%

Other than N what fertilisers do you apply?

Number of respondents = 70				
Starter	Foliar/Liquid	Blood & bone	Manure or compost	Green manure
79%	7%	1%	12%	1%

How do you determine nutritional requirements?

Number of respondents = 82				
Soil Tests/removal/ What I did last year	Soil Tests/Removal	Soil Tests/what I did last year	Soil Test/leaf & petiole/ Removal	What I did last year
42%	35%	10%	11%	2%

Do you think the workshop has been beneficial in helping understand soil and nutrition?

Number of respondents = 82		
Yes	No	Undecided
94%	0	6%

Do you use plant tissue analysis to monitor crop nutrition balances to meet crop nutrient demand and if not, would you like to?

Number of respondents = 32		
Yes	No	Undecided
100%	0	0

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Survey Discussion

- A large proportion of the industry is splitting applications of nitrogen to help better manage supply with crop demand. Without closer investigation into individual paddock history, full nutrient analysis and agronomic practices, the results on applied nitrogen rate need to be kept in perspective where a wide variation will impact on nitrogen rate.

- There is a poor uptake of nitrogen inhibitor fertiliser products in the farmers fertiliser mix

- Irrigation management is seen by growers as the leading farm practice to mitigate denitrification; duration of irrigation, slope of paddock followed by deep placement of nitrogen product.

- Almost the entire sample of growers and advisors surveyed included soil tests in their method of calculating crop nutrient requirements

- The 3 page post-workshop survey completed by growers showed a clear trend of not completing questions after the first page. It should be noted that both advisors and agronomists have been reported as one respondent; unlike the separate sections of the survey form as questions for growers and questions for advisors.

- The decline in respondents in the final question was due to the question being on the last of the 3 survey pages. Those that responded simply ticked the box or answered "yes" which does not specifically answer the question. None the less, the results present some positive feedback on the value of tissue testing in matching nutrient supply with nutrient demand.

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CFI Project Implications

The project narrative (as per the plain English summary) is as follows;

> This project aims to integrate the latest information on carbon, climate change and emissions management into the cotton industries extension efforts. By up-skilling industry information providers, incorporating information into myBMP and developing carbon farming campaigns with the aim of improving resource use efficiency and reduce land sector emissions.

The workshop survey discussion reveals the sample of workshop participants generally, are moving towards matching crop nutrient demand with crop nutrient supply. Also, results show clearly the overwhelming majority of growers and advisors surveyed actively measured soil nutrients and all of those surveyed are currently, or would like to use petiole testing.

Those practices measured in the 2013 nitrogen workshops are tabled against results from the 2013 CRDC grower practice surveys;

Farming Practice	2013 Nitrogen Workshop Survey	Number of respondents	2013 CRDC Grower Survey	Number of respondents
How much N this season	34%<250kg 66%>250kg	72	243kg av.	165
How did you apply your N this season	52% PP/SD/WR 35% PP/WR 11% PP/SD 2% PP	82	67% PP Survey combinations not compatible	165
Manure or compost in fertiliser program	12%	70	39%	165
Soil Testing used to calculate N rate	98%	32	52%	165
Petiole testing every field every season	-	-	13%	165
Would you like to, or are you currently petiole testing	100%	32	-	-

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- Comparing the two surveys a number of conclusions may be reached in regards to the accuracy of the smaller data set of the workshop survey, the 'type' or 'progressive' farmer that seeks out information at industry field days differing from a wider cross sectional sample from those in the CGP surveys

- The unknown combination of advisors in the workshop survey does present a significant bias in the results, where retail advisors are generally encouraging soil/tissue testing.

- The relative merits of split application are clearly favourable, where water run nitrogen is viewed as a labour friendly and costs effective way to ensure nutrient supply is matched with nutrient demand.

- Entire N pre-plant urea, whilst having obvious advantages of 'set and forget' in larger operations, it would seem this practice is less common in the workshop survey sample than the CRDC cotton grower practices survey. Again, there is no delineation between the growers and advisors represented in the workshop surveys.

- Both survey results (2013 CCA survey results pending) indicate a range of methods for calculating rate and applying nitrogen fertiliser. As research results such as CRDC 'action on the ground' and GRDC 'filling the research gap' on nitrous oxide emissions come to hand, it would seem that growers and consultants are well placed to take advantage of improvements to industry best practice guidelines for nitrogen use.

- 2013 Grower Practice Survey data and the CFI nitrogen workshop survey data will provide valuable information for the planned CRDC industry forum on nitrogen management in July, 2014.

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