



Australian Government

Cotton Research and
Development Corporation

FINAL REPORT 2014/2015

Part 1 - Summary Details

Please use your TAB key to complete Parts 1 & 2.

CRDC Project Number: CGA1508 CGASVCGA

Project Title: Cotton Nutrition Workshop

Project Commencement Date: 3.11.14 **Project Completion Date:** 30.6.15

Part 2 – Contact Details

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Part 3 – Final Report

Background

1. Outline the background to the project.

The Southern Valleys CGA had seen other valleys participate in Back Paddock nutrition workshops and identified this as a need in our region. We sought ways to better engage our cotton growers as many of them are new to the industry. We believed this this project as one way to simultaneously build the capacity of our growers as well as increasing their involvement in the industry and testing alternate nutrient management strategies and tactics.

Objectives

2. The project objectives (from the application) and the extent to which these have been achieved.

The objective of the program was to introduce growers to the various elements required in the management of soil fertility and plant nutrition:

- (a) what cotton requires in terms of soils and plant nutrition management for yield and quality
- (b) key soils/plant nutrition issues in Southern Rivers cotton, and tactical management options to address

- (c) how to integrate soil and plant testing tools into of soil fertility and crop nutrition management strategy
- (d) how to assess the performance of their crop in terms of efficiency of nutrient use, as the basis for developing a soils/nutrition management strategy in line with Cotton BMP guidelines
- (e) By better understanding soil fertility and crop nutrition and being able to more effectively respond, participants are likely to generate costs savings and improved yield and quality outcomes.
- (f) By growers attending with their agronomists we hope to build the levels of trust and improve the communication between these team members.

Methods

3. Detail the methodology and justify the methodology used. Include any discoveries in methods that may benefit other related projects.

In-crop Nutrition Workshop: December 2016

- A 2-3 hour workshop was held in each of the Hillston, Hay and Darlington Pt/Griffith growing areas in December 2014. These were a hands-on and practical approach examining different actual in-crop situations in the 2014-15 crop. The workshops covered soil and plant tissue, irrigation and climatic data as the basis for in-crop fertiliser decisions; rates of nutrient as well various product options.
- The workshops were planned to be in-field, but due to summer storm rain the Hilston and Griffith/Darlington Point workshops were held inside. The Hay meeting was standing in a crop, participants considering the practical soil properties and issues, watering and climatic influences impacting on that site. Total of 3 x 2-3 hour ‘in-field’ workshops held.
- At these events, agronomists and farmers were trained on how to collect plant tissue and water samples to be used in monitoring nutrient status.
- The workshops linked to the Cotton Nitrogen trials that were being conducted in the 2014/15 season.by Kieran O’Keefe CottonInfo. The crop ‘case studies’ would include full profile soil analysis pre-plant, in-crop monitoring by petiole analysis results, field history, irrigation data and yield results.

Date	Location	Attendance
2 December, 2014	Hillston	17
2 December, 2014	Hay	37
3 December, 2014	Griffith and Darlington Point	27
Total Attendance		81

The attached presentation, Appendix 1 details the content that covered the (a) to (f) Objectives above.

Hillston Workshop:
2 December, 2014



Hay Workshop,
2 December, 2014



Darlington Point,
3 December, 2014



Post-harvest/Pre-crop workshop; September 2015:

- Post harvest workshops were held to review the outcomes of the decisions made in the Nitrogen Trials/ Case Studies, and also in response to grower and consultant feedback from the above December 2014 workshops and on issues that came up during the 2014-15 cotton growing season.

Topics:

- The results of the Nitrogen Trials/Case Studies conducted by Kieran O'Keefe.
- Mitigating Nitrogen Losses: Dr Ben MacDonald
- Managing Soil Constraints in Southern NSW by Dr Chris Dowling

The workshop timing prior to the 2015-16 season aimed to use these learnings as the basis for how participating growers and agronomists can develop soils/plant nutrition management strategies for each block, linked to Cotton BMP guidelines.

The presentations are attached as Appendix 2

Date	Location	Attendance
15 th September, 2015	Griffith ex Services Club	20
16 th September, 2015	Hillston	4
Total Attendance		24

Outcomes

4. Describe how the project's outputs will contribute to the planned outcomes identified in the project application. Describe the planned outcomes achieved to date.

Participants learned to make better management decisions when applying fertilisers. We attracted both growers and agronomists to the program (105 total participants).

By Growers and agronomists attending we helped to generate a better working relationships and therefore better industry outcomes.

Following this project growers will also be able to communicate better with researchers as they will have a better knowledge of soil nutrition and it will hopefully build a relationship with researchers.

- **The Project Outcomes will be:**

- **The Economic Benefits will be:**

Through more efficient application of nutrients cost savings can be made. Furthermore improved plant nutrition will result in improved yields, ultimately resulting in improved gross margins for growers.

- **The Environmental Benefits will be:**

A better understanding of the soil and the plant needs means a reduction in unnecessary applications of nutrients which reduced the amount of wasted nutrients washing off and potentially reducing release of greenhouse gases through denitrification.

- **The Social Benefits will be:**

We anticipate an improved relationship between grower and agronomist which is why both were involved.

As many of our growers are new to the cotton industry this has helped to build networks and enhance the relationship between growers so they may be able to support each other at times.

5. Summary of Feedback from participants:

Italics below shows workshop participant feedback.

Detailed feedback is available in Appendix 3 (scanned actual feedback forms)

1. Do you think the workshop will help in your management soils and crop nutrition for cotton production?

12	Yes	If No or undecided, please tell us what you need from future field days of this type.
0	No	
	Undecided	

2. What is your approximate area under irrigated cotton this year? Grower/Advisor (please circle)

See Appendix 1 details

3. How do you currently determine crop nutrition requirements in each cotton field?

<p>Hillston:</p> <p><i>Soil test</i></p> <p><i>First time grower; basing requirements off what crop removal could be</i></p> <p><i>Combination of soil tests and leaf blade petioles</i></p> <p><i>Combination of soil tests and plant tests and crop budget</i></p> <p><i>Soil testing/crop monitoring</i></p> <p>Hay:</p> <p><i>Agronomist</i></p> <p><i>Soil test/leaf test</i></p> <p><i>Petiole/soil test</i></p> <p><i>Soil test, leaf & petiole test, trials</i></p> <p>Are you satisfied with your current method?</p>

Hillston:

Yes but interested in other methods as well

Will know after this season

Yes

Has room for improvement

Hay:

Yes

Undecided

Undecided

4. What is your current fertiliser program? See Appendix 1 details

5. What aspects of your current nutrient management program would you consider changing as a result of what you learned at the workshop?

Hillston:

N application timing to improve efficiency

P levels

Amount of N upfront; may reduce slightly

Probably won't change much but it was a good refresher

Perhaps time of tissue sample, whether leaf or petiole

Mostly already consistent with industry practice

Looking for issues that may be restricting available nutrients and potentially changing program to suit

Hay:

Deep banding vs Spreading

Leaf and stem samples

Fine tuning

Timing of petiole testing

6. Things you would like to learn more about in order to improve management of cotton soils and nutrition:

Hillston:

P uptake & better efficiency

K interactions

Compaction

Deep drainage/Losses

Manures/composts effect on overall soil health

More about analysing soil structure & how to rectify

Sodium/potassium/organic matter management

Any restrictions within our soil type and means of countering these

Hay:

Sodic soils

Drip Irrigation

7. Is there any follow up you would like?

From CottonInfo team?

No responses

With your Cotton Consultant?

No responses

8. Do you use plant tissue analysis to monitor crop nutrition balances to meet crop nutrient demand?

Hillston:

No

Will be doing petiole sampling

Am now

Hay:

No

No

Yes

8. (cont) If not yet using PTA, would you like to?

Hillston:

Yes

Hay:

Yes

Budget

6. Describe how the project's budget was spent in comparison with the application budget. Outline any changes and provide justification.

	Budget	Actual
Professional Fees – Dr Chris Dowling (5 days)	\$6600	\$6600
Travel – 12 hours @ \$50	\$ 660	\$660
Accommodation/flights	\$2200	\$2200
TOTAL*	\$9460	\$9460

In-kind Contribution:

	Budget	Actual
Cotton info – Kieran O'Keeffe	\$ 3000	\$3000
Tom Cowlrick Back Paddock	\$5000	\$5000

Conclusion

7. Provide an assessment of the likely impact of the results and conclusions of the research project for the cotton industry. What are the take home messages?

All of the written feedback received from participants stated that the workshops attendance will help in their management of soils and crop nutrition for cotton production.

Adviser and grower feedback suggests that the Southern Valleys cotton areas are now more aware of the principles of sound nutrition management in cotton, and the role of various tools such as pre-plant soil sampling and in-crop plant tissue testing to determine requirements.

New entrants to the cotton industry continues demand for this information and cotton-specific awareness training for growers and at a more intensive level for advisers.

Feedback on use of tools such as soil and plant tissue sampling is that availability of skilled labour for sampling according to proper protocols can often be a constraint, rather than awareness of the need.

Feedback also suggests that as basic macro and micro nutrition principles have been 'ticked off' the focus has shifted to determinants of variations in yield potential and in particular the role of sub-soil

constraints related to sodicity/salinity/compaction; awareness and understanding of 'non-nutritional' soil constraints as well options to manage these. This is considered as a fundamental determinant of yield potential and addressing this is an essential foundation on which to then fine-tune nitrogen management to optimise yield results and nitrogen use efficiency.

Extension Opportunities

8. Detail a plan for the activities or other steps that may be taken:
 - (a) To tell other CGAs/growers/regions about your project.
 - (b) To keep in touch with participants.
 - (c) For future projects.

Getting Nutrition management right is a key factor in profitable and sustainable production in Southern NSW. The Nitrogen trials conducted by the CottonInfo RDOs was reported in a recent IREC Farmers Newsletter (see attachment N trial report).

A CottonInfo post crop survey is conducted each season with Nutrition reporting and trends over time ensuring on going contact with project participants.

The CottonInfo Nutrition tour in February 2015 reinforced this project with individual speakers focusing on individual nutrition topics including Nitrogen loss management and measuring Nitrogen in the crop.