



# FINAL REPORT

## ***Part 1 - Summary Details***

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

**CRDC Project Number:** CA1801

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**Project Title:** 2017/18 Cotton Map

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**Project Commencement Date:** 10/07/2017 **Project Completion Date:** 30/06/2018

## ***Part 2 – Contact Details***

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## ***Part 3 – Final Report***

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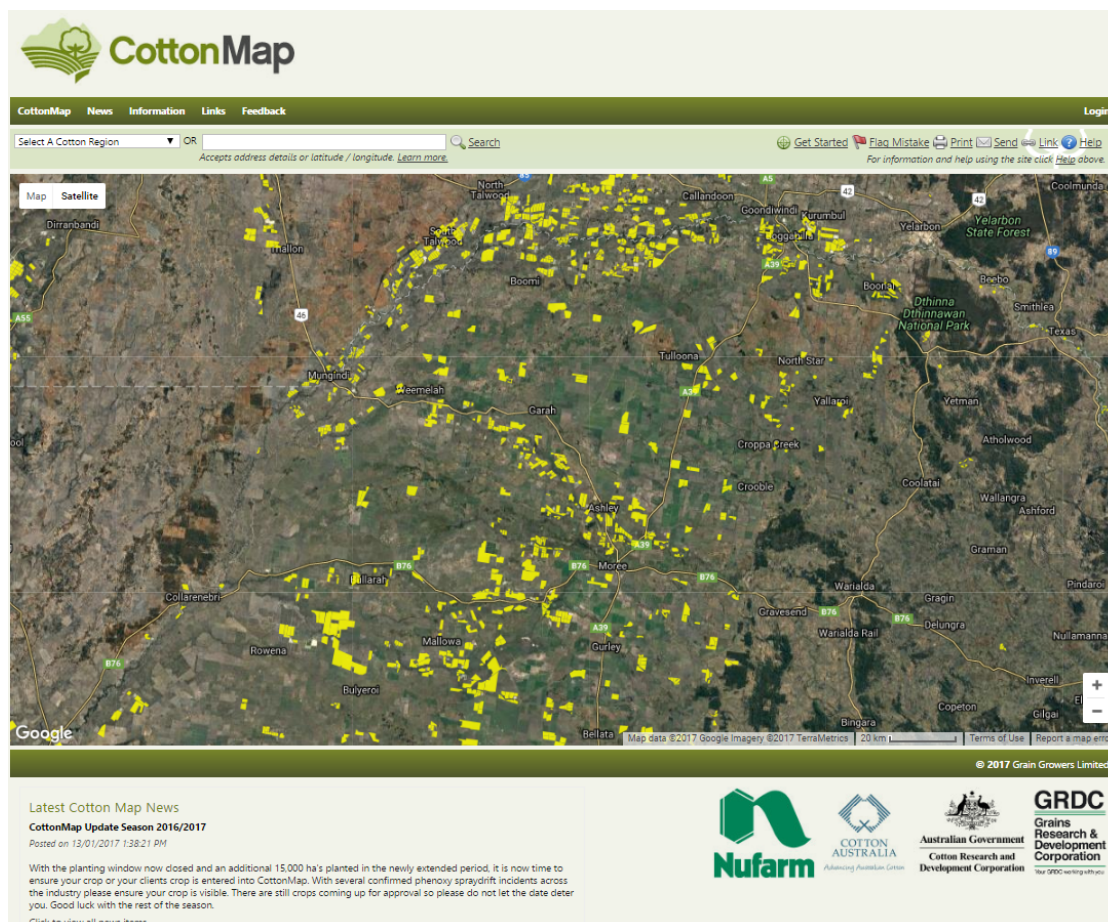
(The points below are to be used as a guideline when completing your final report.)

### ***Background***

#### **1. Outline the background to the project.**

The Cotton Field Awareness Map is an industry initiative which has been designed to highlight the location of cotton fields. The service is provided free of charge with the purpose of minimising off-target damage from downwind pesticide application, particularly during fallow spraying.

Farmers, farm managers, resellers, consultants, agronomists, applicators and contractors are encouraged to input their cotton fields (Figure 1). Users can also access the Cotton Map to check the location of the paddocks they may be planning to spray to assess the proximity of the nearest cotton crop. Since the introduction of Cotton Map, reported herbicide damage to cotton has typically remained below 3%, compared to 11% in 2009 (before introduction of Cotton Map)



**Figure 1** Spray applicators can identify nearby sensitive cotton crops (marked in yellow) when fields are registered to the CottonMap.

### Objectives

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

This project provides for CRDC support to the Cotton Map initiative. This initiative provides ongoing support for an online tool that enables cotton growers to communicate the location of cotton to reduce the risk of off-target damage associated with misuse of Group I herbicides.

#### Mapped area for the 2017-18 season

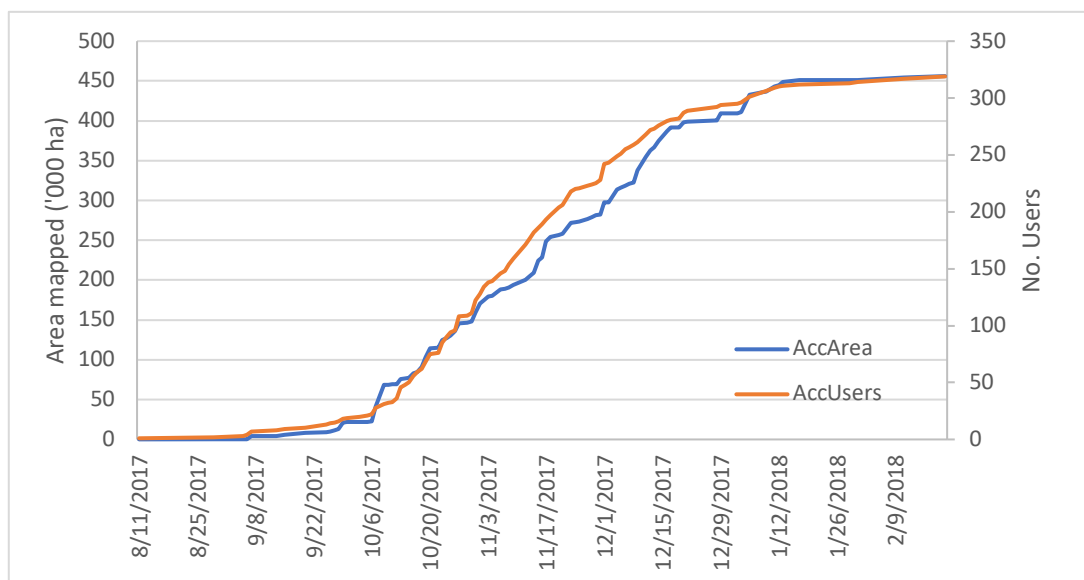
- Planted area: approximately 525,640 hectares was planted, including 452,190 green hectares.
- Mapped area: 452,190 hectares was mapped over 4,302 fields by 319 users (Table 1).
- Approximately 86% of the planted cotton area was mapped to CottonMap (Table 1) which is similar to the previous two years, and may represent a significant portion of first-time growers for the 2017-18 season.
- Strategies to address inaccuracies associated with the ‘area mapped’ continue to be investigated by the service providers.
- Approximately 13 fields were mapped per user (Figure 2) which, similar to previous years, may indicate that a number of consultants/TSPs are mapping on behalf of multiple growers.
- On the 1 November 2017, only 32% of the crop was mapped however, by the 30 November 2017, approximately 50% of the crop was mapped (Figure 2). This is

slightly slower compared with the previous seasons that saw 75% of the crop mapped before 30 November. Further encouragement of early season mapping may increase the effectiveness of the CottonMap campaign.

- Approximately 20% of the crop was mapped in December, which aligns with a period of widespread spray drift damage in NSW.

**Table 1. Summarised usage data for CottonMap between the 2009-10 and 2016-17 seasons.**

Season	No. users	No. fields mapped	Area mapped	Planted hectares	Area mapped (%)
2009-10	214	2,017	173,644	182,000	95.4
2010-11	408	5,326	579,990	607,780	95.4
2011-12	368	5,381	640,394	655,064	97.8
2012-13	214	3,706	383,826	426,494	90
2013-14	207	3,707	420,237	436,470	96.3
2014-15	212	2,287	214,553	205,482	104.4
2015-16	259	2,780	270,181	303,097	89.1
2016-17	309	4,130	473,770	582,888	81.3
2017-18	319	4,302	452,190	525,640	86.8



**Figure 2 Accumulated hectares mapped and number of CottonMap users for the 2016-17 season**

### **Methods**

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

### **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.**

The project output continued access to the CottonMap website for cotton growers and chemical applicators. Provision of this voluntary online initiative has aided in creating an awareness of sensitive cotton fields, reducing the risk of off-target herbicide damage to these crops.

## Research and awareness applications

Data underlying the 2017-18 CottonMap was made available for research purposes including;

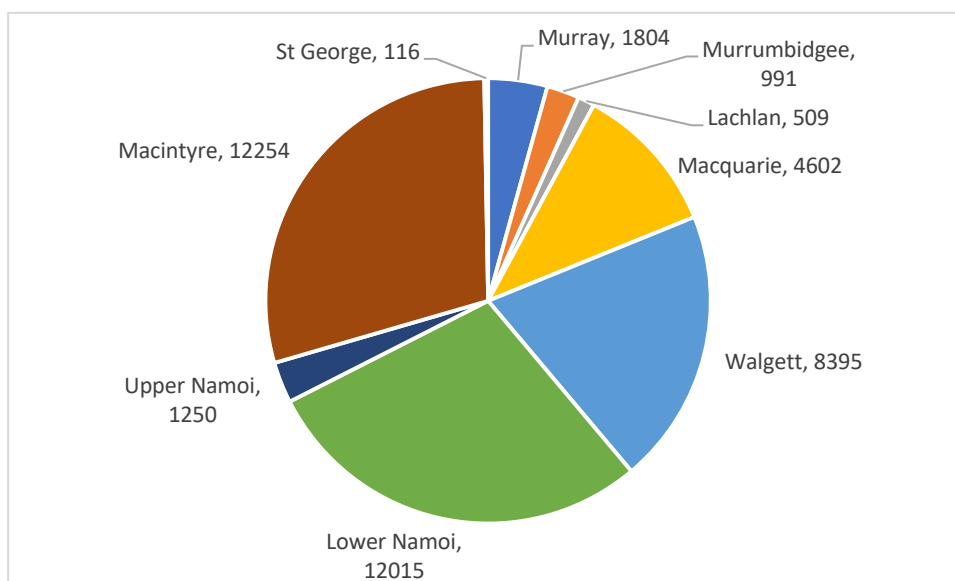
- Quantification of natural assets of cotton properties under a larger natural capital accounting trial (Rural R&D for Profit project 16-03-003)
- Quantification of the potential environmental impacts of pesticides used on cotton farms (DAN1803)
- Investigation for the utility of 10m satellite imagery for determination of the main cropping types (Digiscape Grains project)
- Yield variability at various spatial scales and extents (University of Sydney)

## Spray drift incidences for 2017/18

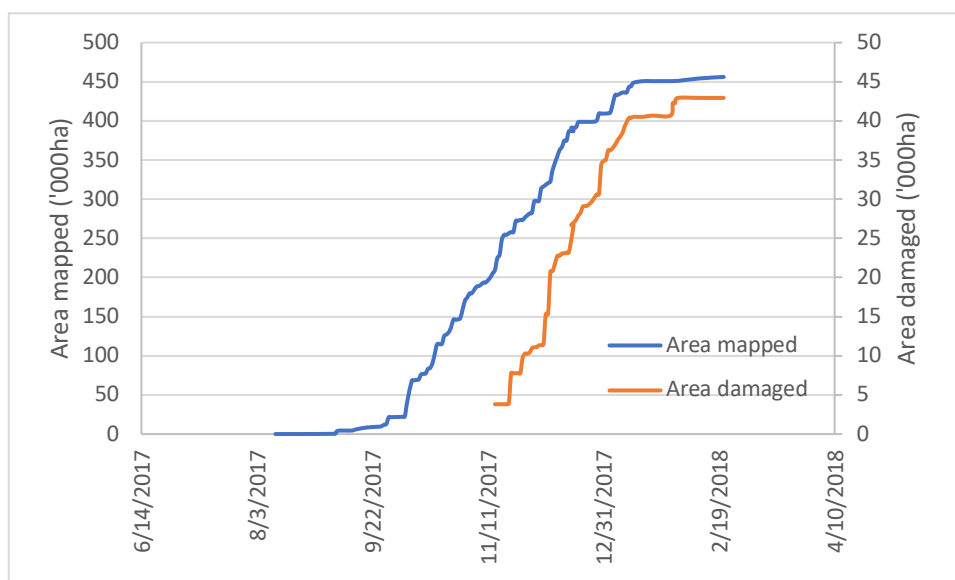
- Cotton Australia was officially notified (via Cotton Australia spray drift report) of 42,936ha cotton affected by Group I herbicides (Table 2) which equated to approximately 8.3% of the total cotton planted area.
- Under-reporting of crop damage was particularly evident in the Southern Valleys, where by anecdotal evidence suggests that the majority of crops were impacted, but only 4 official reports were submitted to Cotton Australia for the Murrumbidgee and Lachlan Valleys.
- Approximately 32% of all crops in the Murray Valley were reportedly damaged, which is the highest rate of incident in any area.
- The Macintyre, Lower Namoi, Walgett, and Macquarie had the highest level of reported damage (Figure 3).
- Damage was reported throughout the season, between the 11 November 2017 and the 21 January 2018. The majority of damage occurred in late December and early January.
- The majority of reported incidents coincided with periods of widespread rainfall throughout the NSW and Qld cotton growing valleys.
- Approximately 84% of reported damage was consistent across the field, suggesting attribution to herbicide application under stable atmospheric conditions, rather than direct drift.
- The majority of reported crop damage (92%) was of low to medium in severity.
- A summary of Cotton Australia's broader efforts around spray drift mitigation during the 2016-17 season can be found at [http://cottonaustralia.com.au/uploads/resources/Cotton\\_Australia\\_spray\\_drift\\_2016-17.pdf](http://cottonaustralia.com.au/uploads/resources/Cotton_Australia_spray_drift_2016-17.pdf)

Table 2. Total area damaged by Group I spray drift, as a percentage of the total planted area.

SEASON	# CA REPORTS	HECTARES DAMAGED	% TOTAL CROP DAMAGED	COST ESTIMATE (\$'000,000)
2008-09	46	15,910	10.6	9.1
2009-10	10	1,740	1	1.7
2010-11	-	-	-	-
2011-12	23	12,144	0.8	14.2
2012-13	41	12,218	2.7	8.8
2013-14	7	780	0.2	0.8
2014-15	5	3,956	1.8	4.5
2015-16	42	11,000	4.1	9.8
2016-17	28	10,000	1.7	3.9
2017-18	94	42,936	9.5	18.0



**Figure 3. Area affected (hectares) by damage associated with Group I herbicides for the 2017/18 cotton season, reported through the official Cotton Australia process.**



**Figure 4 Accumulated area mapped to Cottonmap and accumulated area reported to show symptoms of Group I herbicide damage.**

## 5. Please report on any:-

- Feedback forms used and what the results were
- The highlights for participants or key learnings achieved
- The number of people participating and any comments on level of participation

## Feedback from growers

Feedback was received from users of CottonMap regarding the following

- Difficulty in viewing fields
- Requests for users to be able to identify fields impacted by spray drift on the cotton map
- Confusion over whether fields exceeding 300ha could technically be mapped
- Requests to include a circle function around mapped fields that extended out for a 10km radius
- Requests to map all sensitive crops

- Opportunities for connectivity with other platforms (e.g. weather sites, BeeConnected)
- Requests to print maps in the local papers
- Increased awareness for dryland and broadacre chemical applicators

## Level of participation

- Traffic through the CottonMap website has been increasing since 2012-13, with a maximum number of page views recorded for the 2017-18 season (Table 3).
- The proportion of CottonMap users accessing the website through mobile platforms has steadily increased between the 2010-11 and 2017-18 season (Figure 5).
- A total of 27,053 page views were recorded for the map of cotton fields, which is approximately 87% of all page views.
- The average session time for the cotton map was approximately 3 mins and was increased to 4 mins when accessed through the mobile site (/Mobile/Map).
- For the CottonMap (/map), session durations were higher for users on computers compared with tablets, which may indicate that users prefer a desktop to map cotton fields. Average session durations were lowest for mobile devices, which may indicate that chemical applicators are checking the cotton map predominantly using mobile platforms.
- A total of 780 page views were logged on sections of the CottonMap website that hold additional resources (e.g. information and news).
- Approximately 3.3% of page views were associated with changing passwords and page administration.

**Table 3 Analytics overview for www.cottonmap.com.au**

Season	Users	Avg. Session Duration	Sessions	Pages / Session	Page views
2009-10	182	69	294	1.4	410
2010-11	3,301	165	7,906	2.3	17,938
2011-12	2,994	210	6,557	2.5	16,181
2012-13	1,843	191	3,411	2.5	8,571
2013-14	2,309	223	4,811	3.1	15,103
2014-15	2,526	192	5,184	2.7	13,961
2015-16	3,638	169	8,150	2.4	19,346
2016-17	8,060	113	14,667	2	29,391
2017-18	9,634	89	17,368	1.8	31,231

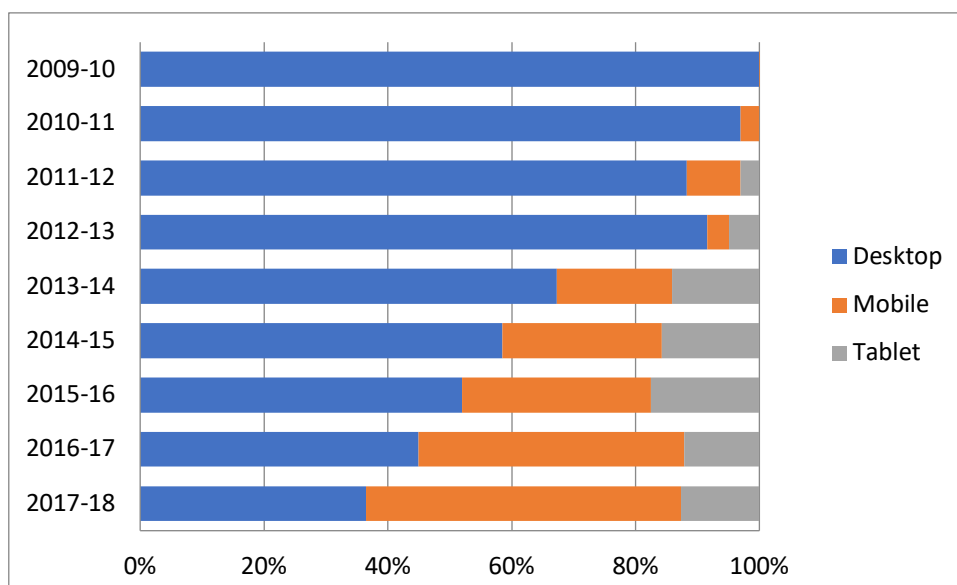


Figure 5. Number of users accessing [www.cottonmap.com.au](http://www.cottonmap.com.au) through mobile devices

### ***Budget***

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

The project's budget was spent in accordance with the application budget.

### ***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?**

- Uptake for CottonMap is currently good
  - Approximately 87% of the total planted area was mapped
  - Approximately 27,053 page views for the CottonMap
  - Approximately 780 page views for additional resources hosted on the CottonMap website.
- A significant proportion of the total planted area was not included on the CottonMap for 2017-18. This could be associated with a large number of new growers, particularly in areas that are not traditional cotton growing areas.
- Despite significant investment in spray drift mitigation by the cotton industry, cotton crops continue to be impacted by herbicide misuse.
- Feedback for improvements for the CottonMap website continue to be investigated by Cotton Australia and NuFarm Australia.