



FINAL REPORT

For Public Release

Part 1 - Summary Details

CRDC ID: CA1904

Project Title: 2018/19 Cotton Map

Project Start Date: 1/07/2018

Project Completion Date: 30/06/2019

Research Program: 1 Farmers

Part 2 – Contact Details

Administrator: Sally Ceeney

Organisation: Cotton Australia

Postal Address: 4.01, 247 Coward St Mascot 2020

Ph: 0459189771

Fax:

E-mail: sallyc@cotton.org.au

Principal Researcher: Sally Ceeney

Organisation: Cotton Australia

Postal Address: 4.01, 247 Coward St Mascot NSW 2020

Ph: 0459189771

Fax:

E-mail: sallyc@cotton.org.au

Supervisor: (Name & position of senior scientist overseeing the project).

Organisation:

Postal Address:

Ph:

Fax:

E-mail:

Researcher 2: (Name & position of additional researcher or supervisor).

Organisation:

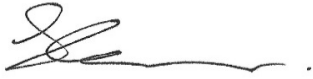
Postal Address:

Ph:

Fax:

E-mail:

Signature of Research Provider Representative:



Date submitted: _____

Part 3 – Final Report

(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)

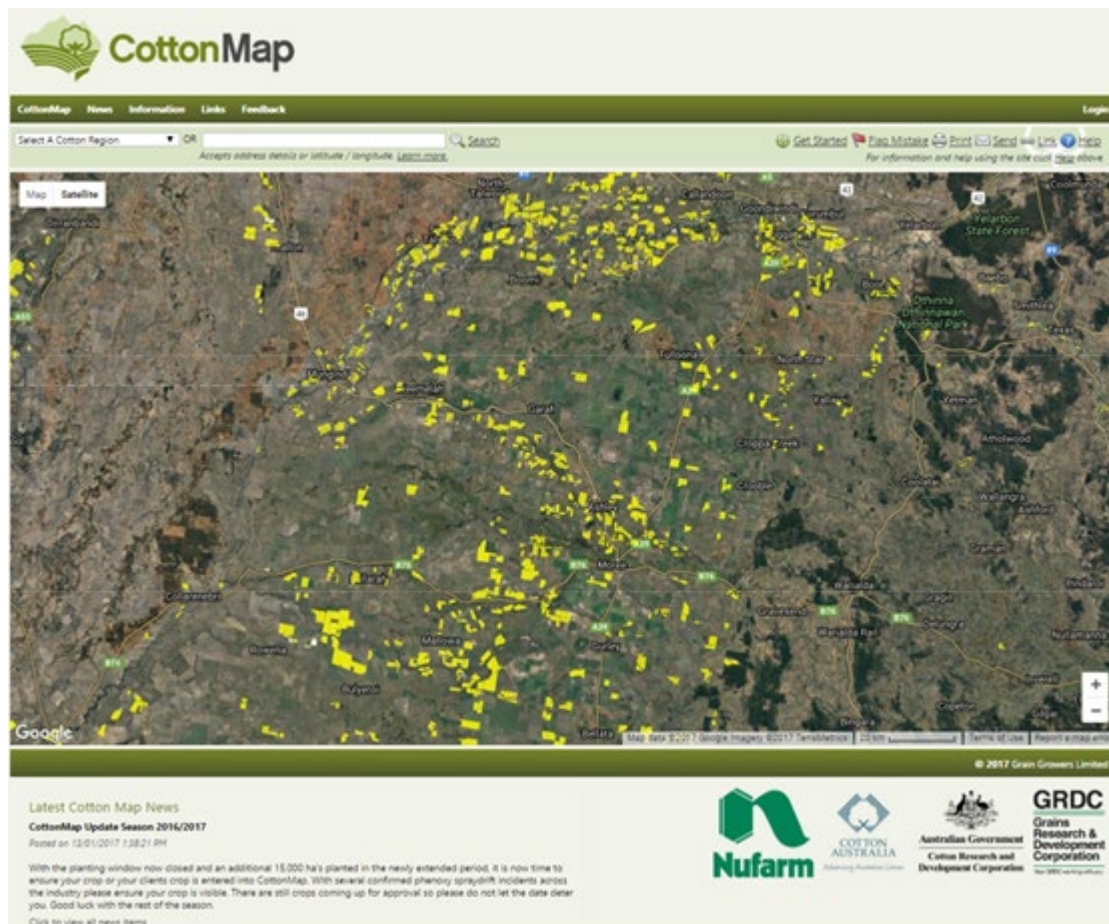


Figure 1 Spray applicators can identify nearby sensitive cotton crops (marked in yellow) when fields are registered to the CottonMap.

Objectives

2. List the project objectives and the extent to which these have been achieved, with reference to the Milestones and Performance indicators.

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 2018-19 season

- Planted area: approximately 379,310 hectares was planted, including 292,380 green hectares.
- Mapped area: 327,311 hectares was mapped over 3,156 fields by 271 users (Table 1).
- Approximately 86% of the planted cotton area was mapped to CottonMap (Table 1) which is similar to the previous three years.
- Strategies to address inaccuracies associated with the 'area mapped' continue to be investigated by the service providers.
- Approximately 12 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.

Table 1. Summarised usage data for CottonMap between the 2009-10 and 2018-19 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
2018-19	271	3,156	327,311	379,310	86.3

Methods

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

The CottonMap project has previously been delivered to industry via a digital platform managed through GrainGrowers. Cotton Australia were advised in late 2018 that GrainGrowers had sold their digital ag business to FlouroSat, which included the CottonMap platform. The CottonMap program was delivered by FlouroSat for the 2018/19 season.

Results

4. Detail and discuss the results for each objective including the statistical analysis of results.

Outcomes

5. 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.

Spray drift incidences for 2018/19

- Cotton Australia was officially notified (via Cotton Australia spray drift report) of 18 incidents totalling 5760ha cotton affected by spray drift (Table 2) which equated to approximately 1.97% of the total crop damaged, compared to 8.3% the previous season.
- Damage was evenly spread across all growing regions. 53% of reported damage was in QLD and 47% in NSW.
- Damage was reported early in the season, from October through to the start of January.
- The majority of reported incidents coincided with periods of widespread rainfall throughout the NSW and Qld cotton growing valleys.
- It is likely that the reduced number of incidents is indicative of the reduced ha planted in 2018/19 and the widespread dry conditions.
- The majority of reported crop damage (58%) was reported as low severity.
- Under-reporting of crop damage continues to be evident with the 2019 CRDC Grower Survey indicating that 19% of growers were impacted by spray drift in 2018/19. Of those affected, an average of 24% of the crop area was damaged, with an average yield loss of 0.7 bales/ha. These figures are considerably higher than those officially reported to Cotton Australia.

Table 2. Total area reported damaged by spray drift each season

Season	# CA REPORTS	HECTARES DAMAGED	% TOTAL CROP DAMAGED	COST (\$'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
2018-19	18	5760	2.0	6.7

CottonMap forms part of a broader spray drift strategy by Cotton Australia, which includes:

- Raising awareness through media campaigns and radio ads
- Informing spray drift policy and working towards consistent messaging and collaborations from all ag sectors
- Encouraging reporting of spray drift incidents and collating those reported
- Training and informing of pesticide application best practice through myBMP, AgSkilled and other workshops.

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 2018-19 season (Figure 5).
- A total of 26,672 page views were recorded for the map of cotton fields, which is approximately 86% 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.

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
2018-19	9,118	90	16,525	1.8	30,856

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
- Technical issues with fields disappearing after being mapped
- Requests to be able to import farm maps, and not have to re-enter fields every season
- Technical issues with CottonMap led to some growers reporting decreased confidence in the reliability of information shown on CottonMap.

6. Please describe any:-

- a) technical advances achieved (eg commercially significant developments, patents applied for or granted licenses, etc.);
- b) other information developed from research (eg discoveries in methodology, equipment design, etc.); and
- c) required changes to the Intellectual Property register.

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 86% of the total planted area was mapped
- Approximately 30,856 page views for the CottonMap
- Despite significant investment in spray drift mitigation by the cotton industry, cotton crops continue to be impacted by herbicide misuse.

In response to feedback from users and a change in platform ownership, a decision was made to investigate alternative options to deliver a crop mapping service that would offer the following benefits:

- Ability to map other crop types, not restricted to cotton
- Improved usability
- Cost effective
- Ability to be agile and respond to changes in technology, link with other technology platforms to increase value for users and funding bodies

Interested parties were invited to submit an Expression of Interest to Cotton Australia for the delivery of a new service. Following a due diligence process the decision was made to change service providers for the 2019/20 season to Precision Cropping Technologies, offering the SataCrop program which delivers on all the above criteria.

This report has been submitted late due to delays in Cotton Australia receiving the data from Flourosat. Unfortunately, Fluorosat has experienced some staff turnover and key staff members that dealt directly with Cotton Australia on CottonMap had left the organisation. Once contact was made with alternative staff of Flourosat the data was promptly provided.

Extension Opportunities

8. Detail a plan for the activities or other steps that may be taken:

- (a) to further develop or to exploit the project technology.**
- (b) for the future presentation and dissemination of the project outcomes.**
- (c) for future research.**

**9. A. List the publications arising from the research project and/or a publication plan.
(NB: Where possible, please provide a copy of any publication/s)**

B. Have you developed any online resources and what is the website address?

Part 4 – Final Report Executive Summary

Provide a one-page summary of your research that is not commercial in confidence, and that can be published on the internet. Explain the main outcomes of the research and provide contact details for more information. It is important that the Executive Summary highlights concisely the key outputs from the project and, when they are adopted, what this will mean to the cotton industry.

Uptake for CottonMap was high for the 2018/19 season

- Approximately 86% of the total planted area was mapped
- Approximately 30,856 page views for the CottonMap

Despite significant investment in spray drift mitigation by the cotton industry, cotton crops continue to be impacted by herbicide misuse. This is reflective of spray drift being an issue that needs to be addressed via a number of channels, including training and education, and that while a mapping platform is a very useful and helpful tool, reducing spray drift requires a collaborative effort across industries and via a number of different pathways.

In response to feedback from users and a change in platform ownership, a decision was made to investigate alternative options to deliver a crop mapping service that would offer the following benefits:

- Ability to map other crop types, not restricted to cotton
- Improved usability
- Cost effective
- Ability to be agile and respond to changes in technology, link with other technology platforms to increase value for users and funding bodies