GRASSROOTS GRANT FINAL REPORT

Part 1 - Summary Details

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

CRDC Project Number: **CGA2102**

CGA: **Macquarie CGA**

Project Title: **Grassroots Grant: Digitally Enabled Cotton Farms**

Project Commencement Date: **01/09/2020** **Project Completion Date: 30/06/2022**

Recognition of support: The Research Provider, Macquarie Cotton Growers Association acknowledges the financial assistance of the Cotton Research and Development Corporation in order to undertake this project.

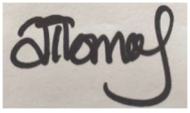
Part 2 – Contact Details

Administrator: Nicole Risely

Organisation: Macquarie Cotton Growers Association

Project Manager: Amanda Thomas

Organisation: Macquarie Cotton Growers Association

Signature of CGA Representative: 

Date submitted: __31/7/22___

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.

Many growers are unable to utilise new and transformative technologies due to their farm location not having access to a phone signal and or acceptable internet capabilities. Mobile black spots create limitations to productivity, profitability, sustainability, and safety of Australian cotton farms. As with the other regions of the world, the next biggest movements in productivity and growth for future generations will come from technological advancement. The level of Agtech development occurring throughout Australia is quite impressive; however, there is one considerable barrier to entry for many producers: *the infrastructure connecting these devices to the internet*.

The risk to the Australian agriculture industry is our lack of internet connectivity in rural regions, which restricts our ability to adopt the latest technological developments.

Objectives

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

This project seeks to identify and overcome issues and barriers that are preventing cotton growers from accessing transformative technologies. Barriers may include things like phone service and internet capabilities. The project objective is to increase connectivity on-farm, to enable use of digital technology and work towards the CRDC target of 85% of devices being linked to the office.

1. **Survey 15-20 growers** geographically spread across the valley, to find out;
    a. What are the barriers to connectivity?
    b. What technology would you use if you could connect?
    c. Do you know of any solutions that could work on your farm?
    d. What are the barriers to adopting solutions?

    Using Survey Monkey via email, we asked these questions of our growers. We had 32 responses and followed up with 17 phone surveys. See Appendix 1 & 2 for question and results.
2. **Form an action group** of committed farmers who are keen to find and implement solutions on their farms (approx. 10 members) – achieved to steer the group and attend 2 subsequent meetings to work with Telcos and suppliers.
3. **Action group to select potential solutions** that could most benefit our farmers – the idea will be to learn directly from those who have overcome the same issues and capture their story for others to learn from. Action groups will contact the Gwydir and Mungindi CGA's and find out what has been happening in their regions. – Achieved and great networking opportunity – gave us the names of two emerging Telcos.

    Some of the things we plan to look at are;

    Private networks: We worked with 2 private Telcos, Field Solutions and Pivotel. They both were applying for federal/state funding for the Regional Connectivity Program. Also explored how the two big Telcos (Optus & Telstra) planned to update or improve local infrastructure and the lack of planned upgrades to 5G regionally. The MCGA also supported Pivotel to request the release of certain band widths on the network to allow new telcos to utilise these in regional locations. We provided data for the Black Spot government project to improve service in black spots. Subsequently 3 new Optus towers have been added in the region, which has improved service (only slight barrier has been for all those growers who have set up everything with Telstra accounts as they now have to change over to Optus to benefit from this improved service).

VOIP (Voice over Internet): This was not a popular solution due to time delays and often internet drop outs were worse than mobile service. However technology is improving rapidly

Phone plans: We explored a solution provided by Zetifi – A whole network boost using existing Farm infrasture to essentially build a tower on with the addition of a Rover unit (mobile) that boosted signal with dual SIM so able to switch between Telstra and Optus depending on the strongest signal depending on where it is located. It uses magnets to attach to vehicles so is easily transferrable. Only cost of running two SIMS and the data was noted by trialists as a prohibiting factor.

Radio Area Networks: Not an area we ended up exploring much, the focus was on mobile service as the survey results directed us.

4. **Northern and Southern Study Tour** that will investigate many different solutions that are commercially available and in the pipeline.
   - Unfortunately we were not able to take the tour due to COVID restrictions in place.

Methods

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

a)Survey 15-20 growers geographically spread across the valley, to find out;

. What are the barriers to connectivity?
a. What technology would you use if you could connect?
b. Do you know of any solutions that could work on your farm?
c. What are the barriers to adopting solutions?

b)Form an action group of committed farmers who are keen to find and implement solutions on their farms (approx. 10 members).

c)Evaluate survey results and come up with a list of issues, list of potential technologies, data platforms, potential solutions.

d)Action group to select potential solutions that could most benefit our farmers – the idea will be to learn directly from those who have overcome the same issues and capture their story for others to learn from. Action groups will contact the Gwydir and Mungindi CGA's and find out what has been happening in their regions.

e)Northern and Southern Study Tour that will investigate many different solutions that are commercially available and in the pipeline. Some of the things we plan to look at are; Private networks, VOIP (Voice over Internet) Phone plans, Radio Area Networks.

Write up case studies and a final report that captures the learnings of the ACTION group. The report will also capture the barriers and limitations and could be used to work with local councils, politicians, and government bodies to try and overcome the issues we have identified. The report will also capture what practice change happened at a local level.

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.

During this project, the MCGA has been working with Growers and several emerging telcos to better understand what challenges farmers face in the Macquarie Valley and to better understand how these create barriers to enabling technological advancement in the practices of the regions' Growers.

We understand that there is some hesitancy amongst many growers to trial digitally enhanced farming methods, as many farms do not have the connectivity to support the technology, and many have been promised something will work and solve their issues only to find that it does not in real life situations. Many farmers are not willing to outlay the initial expense to purchase digital equipment/devices as they are doubtful, they will be able to get them running consistently and reliably with the current connectivity available.

They believe if the connectivity is not reliable, then it is difficult to trust the data produced, and essentially leads to a question about return on investments. Many Farmers have tried in the past and failed to reach the outcomes they were after, due primarily to poor connectivity, so are understandably reluctant to try again.

The MCGA has worked to support these emerging Telcos, Pivotel and Field Solutions, with local and state government applications to councils for funding to build infrastructure to improve regional networks. We have also trialled booster devices from Zetifi and several growers have had individual Farm plans developed to improve their service to a satisfactory level to support some basic Agtech devices.

The MCGA hosted a field day where Zetifi were invited to demo there services and Rover Unit. Our trialists were invited to share their experiences at this meeting.

The MCGA provided feedback to The Black Spot program, which identified areas of real concern and subsequently 3 towers have been added to improve the Optus network. It has become evident that Telstra are not actively improving existing infrastructure in rural and regional areas, whereas Optus and the emerging Telcos are keen to improve service access in these areas with the support of Government schemes. This impacts growers choice on the Telco provider they choose going forward, especially if they are wanting to benefit from the AgTech available now and in the future.

5. Please report on any:-

A) Feedback Forms:

- Survey Questions (used Survey monkey) Appendix 1
- Phone Survey Questions Appendix 3
- Feedback of Zetifii Rover Unit x3 Appendix

B) Key Learnings:

- Over 80% of those responding to the survey reported frequent dropouts of both internet and phone services.
- They noted that the service was getting worse despite already adding other devices to boost service in their homes and to vehicles.
- Cost of both the boosters and the data was prohibitive
- Mobile service was more important to than internet service, primarily due to WH&S.
- The issue of bad mobile and internet service impacted most farms (>80%) and Safety was equally as important to farmers as maximising productivity efficiencies on Farm.

C) The number of people participating and any comments on level of participation:
The initial survey targeted all members (160 emails successfully landed). We had 32 responses from 62 members and when asked, over 50% (17) were willing to talk in more detail in a phone survey.

Conclusion

6. 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?
During this project we have discovered there is no "one solution fits all". Despite there being lots of commercially available options, they don't all fit individual farms due to the identified barriers like phone signal, tree lines, topography, and geography. We believe that each Farm will need to overcome its individual issues and barriers that are preventing them from accessing transformative technologies.

The most important outcome from the 'Digitally Enabled Cotton Farms" project is the discovery that fortunately there are multiple suppliers who are very willing and are able to provide individual farm plans for improving their connectivity using a combination of

existing telcos, and enhancing available networks with some additional infrastructure (at the Growers expense) See Zetifii presentation (Appendix 6). There is also both Federal and Local Funding available to help improve connectivity. We worked with emerging service providers to support government applications for funding to improve the local infrastructure (Appendix 4 – Field Solutions Regional Connectivity Program Application, Appendix 5 – Pivotel Letter of Support).

Once these initial barriers are overcome, it is important for Farmers to identify and understand what it is they want to improve and what solutions are available to make this happen. Trialling equipment in these situations is invaluable to allow Growers to see the benefits firsthand. Of 34 growers surveyed 83% said they see this research investment as a major priority.

Extension Opportunities

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

(a) To tell other CGAs/growers/regions about your project at meetings (Appendix 7 Field Day invite), through Case studies as these are completed.

(b) Utilise the learnings from trialists to share their experiences and become advocates for solutions eg the Zetifii Rover unit trial by our farmers.

(c) Find the advocates for using Agtech once the issue of connectivity is at an acceptable level, to trial more devices eg Cameras/sensors etc to gain experience and see the results of such devices and how they help with efficiencies & safety on farm.

Please email your completed report to research@crdc.com.au