Final report

Developing an Online AgTech Savings and Benefits Calculator

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Abstract

This project "Developing an Online AgTech Savings and Benefits Calculator" was undertaken to further refine a concept excel based cost benefit estimator tool developed by KPMG and MLA. The project sought to test the calculations, use cases, functionality and the merit of an online tool to inform the development of a fully functional cost benefit estimator tool in the future.

Through engagement with producers and technology vendors, the project tested the benefits of adoption of AgTech solutions across three use cases – water monitoring, pasture management and livestock monitoring. Over 70 industry stakeholders were provided with an opportunity to review the excel based cost benefit estimator tool and online clickable prototype that provided an example of the user experience for industry feedback. Two iterations of a clickable prototype were developed during the project, sharing developments with key stakeholders at Beef Week in May 2021.

Project outcomes included specific feedback that can be incorporated into a minimum viable product (MVP) online tool in the future, coupled with widespread engagement with producers, vendors and potential funding partners for the MVP moving forward. Industry stakeholders expressed a clear desire for the tool to be made available in an online format (as opposed to excel based) for ease of use and maintenance of data sources (i.e. technology and on-farm costs) to be analysed by the tool.

The project provides the basis for a fully formed online benefit estimator tool that could consider both tangible and intangible benefits of AgTech use, supporting the resilience and profitability of producers. The project can also provide a means to baseline and assess the performance of MLA Smart Farms that deploy AgTech on test farms, providing valuable insights into the efficacy and development of AgTech for producers and technology vendors.

Executive summary

Background

The purpose of this project was to test and develop a concept AgTech savings and benefits calculator incorporating feedback from producers, vendors and broader red meat industry stakeholders.

The target audience for the project was primarily producers, with benefit also provided to AgTech vendors (who seek to develop solutions that add value to producer's operations) and potential funding partners (who seek to understand the value proposition for such a tool, including its application beyond the red meat industry).

The project confirmed that the industry does place value on a tool that can objectively assess the benefits provided by various AgTech solutions, and further, that an online form of tool is preferred. The clickable prototype developed and tested as part of this project was also well received by stakeholders during this project, with feedback from industry to inform further refinement of the tool when it is developed in a minimum viable (fully functional) form.

Once operational, an online AgTech cost benefit estimator tool will help producers make informed decisions around investment in and deployment of AgTech solutions on farm. MLA will also be able to use such a tool to objectively measure the performance of its Smart Farm sites.

Objectives

- Test the use cases, data sources and calculations provided by the excel based tool (Achieved)
- Confirm the industries preferred form of an estimator tool (e.g. excel, online) (Achieved)
- Develop and test a clickable prototype for the online delivery of a tool to inform the functionality and user experience of a fully functional tool (Achieved)
- Identify potential funding partners interested in supporting the further development of the tool (Achieved)
- Identify additional opportunities for the application of the tool, such as MLA's measurement of Smart Farm sites and MLA funded projects involving use of AgTech on farm (Achieved).

Methodology

- Review and develop AgTech cost benefit estimator excel tool from previous phase of work
- Develop wire frames of online clickable prototype to test with stakeholders
- Consult with producers, vendors and other relevant industry stakeholders (incl. Departments of Primary Industry)
- Iterate the clickable prototype in preparation for Beef Week in May 2021
- Develop supporting briefing materials for KPMG and MLA staff in attendance at Beef Week 2021
- Test excel tool and clickable prototype with industry stakeholders at Beef Week 2021, collating feedback to support further development of a minimum viable product in subsequent phases of work.

Results/key findings

Key results of the project were as follows:

- Confirmation of the value proposition behind a cost and benefit estimator tool
- Confirmation of industries requirement for the tool to be online based
- Confirmation of key features of such an online tool
- Identification of potential funding partners to support the ongoing development of the tool

Due to the potential release of a MVP online calculator the prototype design is commercially sensitive to MLA until such time as the tool is formally launched by MLA.

Benefits to industry

The project provided benefits to the red meat industry by identifying and quantifying ways in which investment in and deployment of AgTech solutions can support productivity of farming operations. This project forms the basis for expansion into further use cases that will benefit industry.

The project has also identified a tool that will enable MLA to measure the performance of its Smart Farm Sites, supporting the efficient expenditure of levy payer contributions.

Finally, the project has identified a tool that could potentially be applied across sectors broader than red meat, supporting the productivity and profitability of multiple sectors of agriculture.

Future research and recommendations

The project has identified a need research and development projects in the following areas:

- Development of a minimum viable online AgTech cost and benefit estimator tool to inform producer decision making
- Research into the application of the online tool to inform MLA's measurement and evaluation of the performance of its Smart Farm sites and funded deployments of AgTech in MLA projects
- Engagement with selected stakeholders to support the funding / expansion of the online tool

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1. Background

1.1 Assessing the benefits of AgTech

There are a variety of AgTech solutions available to producers. This project has sought to progress the red meat industry's understanding of the value proposition that supports producer's investment in and deployment of AgTech. The tool seeks to provide an objective assessment of AgTech solutions, that can inform producer's engagement with technology vendors.

There is no current technology agnostic solution that can assess the benefits of AgTech, considering the bespoke needs of a given producer. This solution seeks to inform red meat producers but can also form the basis for a tool that services other sectors such grain, wool or cotton (which forms a part of many mixed farming operations).

The outputs of this project will inform the development of a minimum viable online product, that being a fully functioning online tool that incorporates current data with respect to AgTech costs and is applied against existing costs (e.g. labour, fuel) to calculate the notional benefit of the adoption of an AgTech solution(s).

2. Objectives

The original objectives of the project where as follows:

- Test the use cases, data sources and calculations provided by the excel based tool (Achieved)
- Confirm the industries preferred form of an estimator tool (e.g. excel, online) (Achieved)
- Develop and test a clickable prototype for the online delivery of a tool to inform the functionality and user experience of a fully functional tool (Achieved – screen shot displayed in Appendix 1)
- Identify potential funding partners interested in supporting the further development of the tool (Achieved)

In addition to the original objectives of the project, additional opportunities for the application of the tool, such as MLA's measurement of Smart Farm sites were identified. This will enable MLA to develop a consistent, data driven monitoring and evaluation framework for its projects involving funded deployment or research involving producers use of AgTech solutions.

3. Methodology

3.1 Stakeholder engagement plan

KPMG and MLA reviewed and collated various channels to red meat producer and AgTech vendor stakeholders, approaching stakeholders for a 30-45-minute interview to test the excel based tool and the first iteration of the clickable prototype.

This process was impacted by limited availability of key stakeholders in April during the lead up to Beef Week 2021, with access to multiple stakeholders mitigated by the introduction of group review sessions (over individual consultations) to enable sufficient feedback to test the excel and clickable prototype tool in the lead up to Beef Week 2021. This process was not as efficient as first thought, however the focus of stakeholder engagement pivoted to Beef Week where significant industry

engagement took place. In total more than 70 producers and vendors were engaged to test and feedback on the AgTech cost benefit estimator tool (screen shot shown in Appendix 1).

3.2 Further refinement of the use case calculations

Building on the concept cost benefit estimator tool developed in a previous project, further refinements to the excel tool were made, informed by feedback from stakeholder consultation. This included simplification of language and refinement of data sources.

3.3 Develop wire frames for a clickable prototype

To inform the stakeholder consultations and gain an understanding of the preferred user experience, wireframe "still shots" of a clickable prototype where developed. These wire frames were tested with MLA for alignment MLA branding / style requirements and also with stakeholders for feedback on notional tool content and general layout

3.4 Consultation with industry

The project involved consultation with industry (producers, vendors and other relevant industry stakeholders incl. Departments of Primary Industry) to ensure that the excel tool and clickable prototype where fit for purpose and suitable for testing with a broader audience at Beef Week 2021.

3.5 Further iteration

Stakeholder feedback informed further iteration of the clickable prototype tool to improve the user interface, focusing on simplicity of language, ease of use, inclusion of relevant content (such as links to supporting research).

3.6 Validation at Beef Week 2021

Briefing materials were developed to support the delivery of consistent messaging around project value proposition and functionality of the excel tool and clickable online prototype. Refer Appendix for comprehensive detail regarding briefing materials.

The excel tool and clickable prototype were tested with industry stakeholders at Beef Week 2021, with feedback collated to support further development of a minimum viable product in subsequent phases of work.

4. Results

4.1 Key findings

During the project, key findings that were identified included:

- General acceptance of results identified by the tool following input of producer scenarios and data points. Further analysis of calculations provided by the tool will be reviewed in future iterations of the tool (refer development of an MVP).
- General acceptance of the clickable prototype as a suitable online tool / interface. Further refinement of the tool will be incorporated in the development and testing of the MVP, including

simplification of language, carrying forward common data to avoid re-entry / inconsistent entry, use of drop down menus to enhance ease of tool use.

- The project successfully delivered a high fidelity clickable prototype that facilitated engagement with industry stakeholders and potential project funders for future development of the tool. MLA have detailed insight into the user experience desired by industry stakeholders and the key functions required of the tool to deliver value for producers.
- Detailed engagement with industry was achieved. A summary of industry feedback is detailed below and can be supplemented by feedback obtained directly by MLA through the MLA Beef Week site survey questionnaire.
- Interest from potential funding partners including state government departments of primary industry, providing opportunities for MLA to fund individually or partner with other organisations to expand the scope of the MVP, including both the incorporation of further detailed use cases in the red meat sector as well as application to other sectors of agriculture (e.g. horticulture, grains, fisheries).

4.2 Water use case

Key findings with respect to the water use case that supported the prototype or could be incorporated in future iterations of the AgTech cost benefit estimator tool included:

Table 1 - Water use case feedback

1	Consensus that the results aligned to expectation from the producers who we stepped through the tool
2	Consider review of article by Anna Cochrane in Beef Weekly 19.4.21 about the CPC Isis property near Longreach 237,000 Ha with 18-26,000 head and 180 stock watering points was recommended as a useful case study https://www.beefcentral.com/ag-tech/how-isis-downs-has-tackled-remote-water-monitoring/
3	Consider asking users to list how many water points they have and how many they'd want to attach sensors to

4.3 Livestock monitoring use case

Key findings with respect to the livestock monitoring use case that supported the prototype or could be incorporated in future iterations of the AgTech cost benefit estimator tool included:

Table 2 - Livestock monitoring use case feedback

1	Consider measuring opportunity cost of losing a heifer in calving stage came up a few times – especially as sector looks to rebuild herds post drought and are breeding from 1-year old heifers instead of waiting a season. We should factor in a scenario of reducing calf & heifer loss in calving – i.e. target say 50% reduction in loss during calving.
2	Consider application for remote farms that have no onsite staff – this scenario came up a few times where producers have a distant property or agistment and might get to the farm once every week or two. We could have a question to distinguish this situation as the risk of greater stock loss to theft, fire etc is higher.
3	With respect to mustering, consider factoring in the avoided inefficiencies of having to re-muster / double back to pick up strays (time saved, fuel saved and safety benefits that come from reducing staff time mustering)

4	Consider developing a reproduction model in the tool (for stud operations) so they can focus on use case for high value breeding stock, identifying cows on heat to optimise AI or crossing with bull (avoid duplicate semen straw deployments $50 each)
5	Consider asking do you use Artificial Insemination? If yes, what is conception rate from first straw e.g. 85%, What would you expect to be able to achieve with specific animal tracking (e.g. 90%) – to work out yield improvement – i.e. work the model on benefits of achieving a 5% improvement in calving production
6	How can we measure narrowing the spread of conception dates in the herd, driving labour costs down and improving efficiency as the support over calving drop could be focused into a more defined period to optimise labour
7	Consider measurement of culling nonperforming cows / ewes and bulls / rams – factor in a question that highlights the opportunity cost of carrying a nonperforming animal (feed loss, unproductive breeding program, water use)
8	Consider stocking rate inputs, how we might factor in improved bull / cow and ewe/ram carrying rate on farm?

4.4 Pasture management use case

Key findings with respect to the pasture management use case that supported the prototype or could be incorporated in future iterations of the AgTech cost benefit estimator tool included:

Table 3 - Pasture management use case feedback

1	Consider building in opportunity cost / benefit to the farmer of being able to carry higher stock rate per hectare with more precise pasture management (release agisted land, carry more stock)
2	Consider measurement of improvement in precision of feed being carried
3	Consider what value would you assign to having continuous seasonal forage management?
4	Consider what value would you get from increasing your carrying capacity by 10%- 100% (slider bar)
5	Consider value of preventing grass going rank
6	Consider location and soil type on this use case – how can the tool cater for different types and locations?

4.5 General feedback on tool and excel file

General feedback on the tool that can be considered in future iterations:

Table 4 - General feedback on tool

1	Consider building in features aligned to future farm pilot programs (i.e. using tool for monitoring benefits accruing to participating farmers and helping to create common structure to case studies)
2	Producers felt that the methodology was helpful to get them thinking about their current level of invested time and resources in monitoring water, livestock and pasture
3	Most producers were happy with the "quick results" detail, but some appreciated the option of getting the tabulated detail result for further detail

4	Producers preference was for the tool to be delivered as an online calculator (not excel) so that it can be kept current and have active links to other useful materials (Agtechfinder, mobile maps, connectivity maps, costings)
5	Need to ensure there is a wide distribution of the tool when it is launched – "I don't want to miss this – please get the message out through multiple channels as I am not a big social media user…." E.g. Website, MLA feedback magazine, NFF, Country Hour, Beef Central
6	An online hosted calculator could allow for identification of situations where below award wages were being paid for water, livestock, pasture monitoring in agriculture – could be a useful data point for insight into fair work compliance
7	Case studies would be very helpful to include – so that producers can read about how others have used tech to free up labour for focusing on more value adding activities / or save costs
8	Front end basic context questions should be introduced regarding: 1. about your farming situation; geo locate your property; hectares farmed (consider if we need this per farm or in total); how many separate properties are you running?; do you run livestock on any properties with no site staff (if so what is the return distance required to be travelled each time you go to the property); consider potential for bushfire risk monitoring on remote properties; average profit per hectare typically achieved is $ / ha; number of watering points you monitor (or would like to)
9	What type of farming operation are you running? Beef (breeding, backgrounding, feedlot); sheep, mixed livestock and cropping (identify the primary crop type)
10	Livestock numbers: select beef or sheep; herd / flock size; number of bulls / rams running on the property; calf / lamb weaning rate you typically achieve; profit per head typically achieved; average value of an animal in your mob; current stock mortality rate (% of herd lost in calving, from pests, disease or climate)

5. Key findings

Key results of the project were as follows:

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6. Conclusion and recommendations

Through engagement with industry prior to and during Beef Week 2021 this project has achieved its objective of validating the value proposition of a cost benefit estimate tool and provided great insight to inform the development of a minimum viable product (MVP). The project has also identified further opportunities to support MLA's research and extension activities as summarised below.

6.1 Further support for an MVP

Industry interest in the concept and the value that it can provide to producers by informing decision making in the AgTech sector was strong and demand is there for further MLA funding to deploy this extension and adoption tool to producers.

6.2 Identified potential funding partners for the development of the MVP

Interest from prospective funding partners to both deliver an online cost benefit estimator and potentially expand to other sectors, which warrants further discussion with possible co-investor partners about the design and functionality of the online calculator.

KPMG will assist MLA to engage with these prospective parties and develop a framework for how such a collaboration could be implemented both within the red meat sector and broader sectors of agriculture.

7. References

Not applicable.

8. Appendix

Appendix 1 Screenshot: AgTech calculator prototype