

Paddock-level carbon benchmarking – data supporting Australian farmers to make better decisions



For many growers, measuring on-farm carbon is a confusing and difficult procedure that may be put off until it becomes a requirement. This project was a proof of concept to develop a farmer-friendly carbon calculator that collects paddock-level data. The carbon calculator simplifies on-farm carbon audits, captures data via my John Deere and supports farmer decision-making at a paddock level.

Project background

To meet Australia's emissions reduction targets under the Paris Accord, agricultural industries will need to understand and manage their emissions. The first step is to understand existing baseline emissions before undertaking practice changes. Understanding carbon baselines equips growers for any potential mandated reporting, participation in Carbon Farming Projects, and forthcoming Natural Capital Accounting initiatives.

Over the past few years, Farmanco has included carbon audits, based on the recognised GAF carbon calculator as part of its farm-level financial and production benchmarks for clients. However, the data collected was at a whole enterprise/farm level, based on industry standards and not as useful for farm-level decision-making. The project aims to make it easier for farmers to undertake a carbon audit that would be more farmer-friendly and useful.

Farmanco, with its sister company Aglytica, were successful in securing a Department of Agriculture, Fisheries and Forestry's Innovation Expansion grant, managed by the South-West WA Drought Resilience Adoption and Innovation Hub (SW WA Hub). Farmanco used Melbourne University's GAF calculator because it is approved by Clean Energy Australia and linked it to a cloud-based data capture and benchmarking platform.

While there is some interest in reducing carbon among growers, it remains challenging to get adoption. It is seen as controversial and confusing, and as an issue on the horizon that doesn't need to be dealt with immediately. Part of the project's aim was to provide paddock-level data that would also support grower decision making. The project aimed to incorporate Farmanco's existing carbon data into an online platform that allows growers to benchmark their greenhouse gas emissions at an enterprise and paddock level, by integrating paddock-level data from commonly used third party tools such as MyJohnDeere.

Farmer involvement

Farmanco's existing client base provided the bulk of the data and had existing protocols to protect farmer confidentiality and data security. Furthermore, direct farmer participation was also desirable

to provide insights into the calculator's ease of use and utility. Farmanco's relationships with grower groups and the Grower Group Alliance's efforts to promote the calculator and contact grower groups helped overcome some grower concerns about confidentiality and the value of the project. A pilot reference document outlining data confidentiality and security was also developed to allay farmer concerns. Seventeen farmers, including Farmanco clients, and other farmers from grower groups in WA and Victoria participated in the project. Their involvement allowed the inclusion of paddock-level data via MyJohnDeere.

Benefits to individual farmers and industry

The key benefit has been making data collection simpler and the ability to get more enriched data from direct farmer sources. The project presented indicators within tables, charts and graphs for interpretation of carbon measurements and also what best practice carbon measures compared against financial, production and machinery use.

The project has demonstrated that growers can benchmark their emissions by enterprise, paddock, as well as against their peers, and identify actions they can take to reduce Green House Gas (GHG) emissions and the relative costs and difficulties in doing this.

The integration of external data sources, via MyJohn Deere, enables the collection of hundreds of thousands of data points to provide information. Information comes directly from the manufacturers' tools, collecting real farm data related to inputs and carbon use.

This enables a grower to make decisions for future practice change. The use and application of the paddock level data will significantly benefit growers in terms of their rates of application of fertiliser, utilisation of optimised seed variants, crop rotations and mixed farming decisions to maximise profitability, while minimising their GHG footprint. Farmanco's consultants are meeting with participating farm businesses to discuss data and potential changes to their business to enhance financial, and productivity goals and reduce GHG emissions.

I think the other exciting thing is the overall outcome - it's really to provide information to farmers to help protect their livelihoods and meet their sustainability goals- this project contributes to that. Kelly Ryan, Farmanco

I'm really excited by the amount of data that's available and the potential for new discoveries... We now need to explore it and make decisions on how best to use that data for the greater good. It's really about learning what's the case for using the paddock level data... We believe that if we keep working on it, we can find different angles that will really drive on-farm efficiency. Glenn Briggs, Aglytica

A significant advantage of the project for mixed enterprises is that the calculator combines data from different enterprises on one platform – something that was not possible before. For example, enterprise data for cropping and livestock enterprises is now shown on one platform whereas previously growers would need to use two separate excel sheets.

Aside from the benefits for individual farmers the overall benchmarked results provide a more realistic picture of industry/entries carbon emission for a wider audience.

The results of a mixed enterprise audit can be visually presented, offering growers a comparative view of their business emissions within their peer group. Further disaggregation of the data enables an exploration of emissions reduction best practices through benchmarking against peers. Glenn Briggs, Aglytica

Data from the project also debunks the myth that low-carbon farms are less profitable.

Next steps and future benefits

Now that the project has proven the feasibility of the Carbon Calculator, Farmanco will promote the benefits of the calculator via grower groups and other means, outside its client base. So far, the enhanced calculation capabilities have bolstered the adoption of Carbon Audit from Aglytica's general benchmarking activities, resulting in a 9.8% increase in businesses conducting CO2 audits from season 2022 (223 audits) to season 2023 (245 audits).

Given that agriculture will have to prove a reduction in emissions, and this may create advantages for those producers who can demonstrate this by auditing their carbon footprint, the expectation is that growers will increasingly show an interest in tools like the carbon calculator, especially if it helps maintain farm profitability and protect grower livelihoods and meet their sustainability goals.

Farmanco also sees the carbon calculator as an entry point into the carbon space and broader sustainability applications such as Natural Capital Accounting and the Taskforce on Nature-related Disclosures framework that considers market-based solutions related to environmental sustainability.

For more information about this project, visit <https://hub.gga.org.au/paddock-level-carbon-benchmarking-farmanco/>

