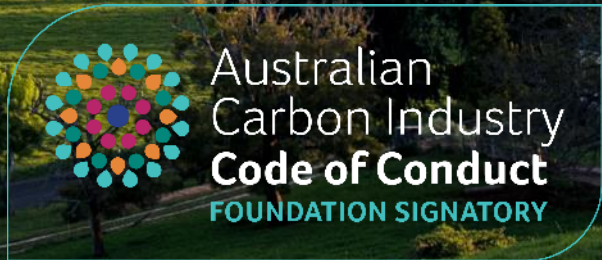


AgriProve

Soil Carbon Opportunities



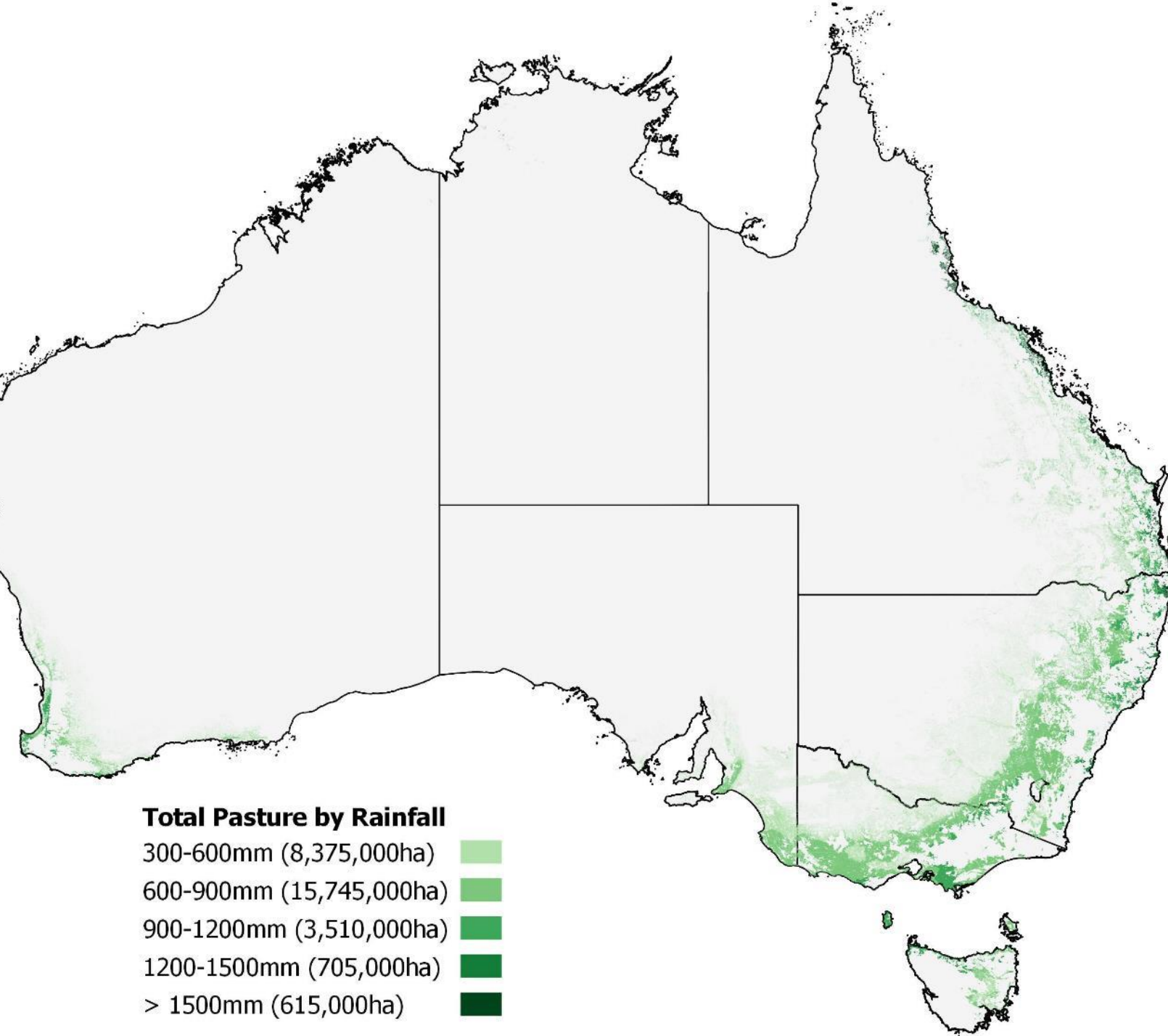


Why soil carbon?

Soil carbon is the score card for the health of your soil. Potential to deliver:

- improved productivity eg. 2x dry matter yields
- improved plant nutrient availability through increased soil biological activity
- better rainfall infiltration and moisture retention
- additional revenue eg. \$50-\$100/ha/yr
- access to carbon neutral markets
- ‘proof point’ for the underlying farming system.

Australian Pasture and SOC Potential



Potential for soil organic carbon sequestration by pasture land use and rainfall zone in Australia

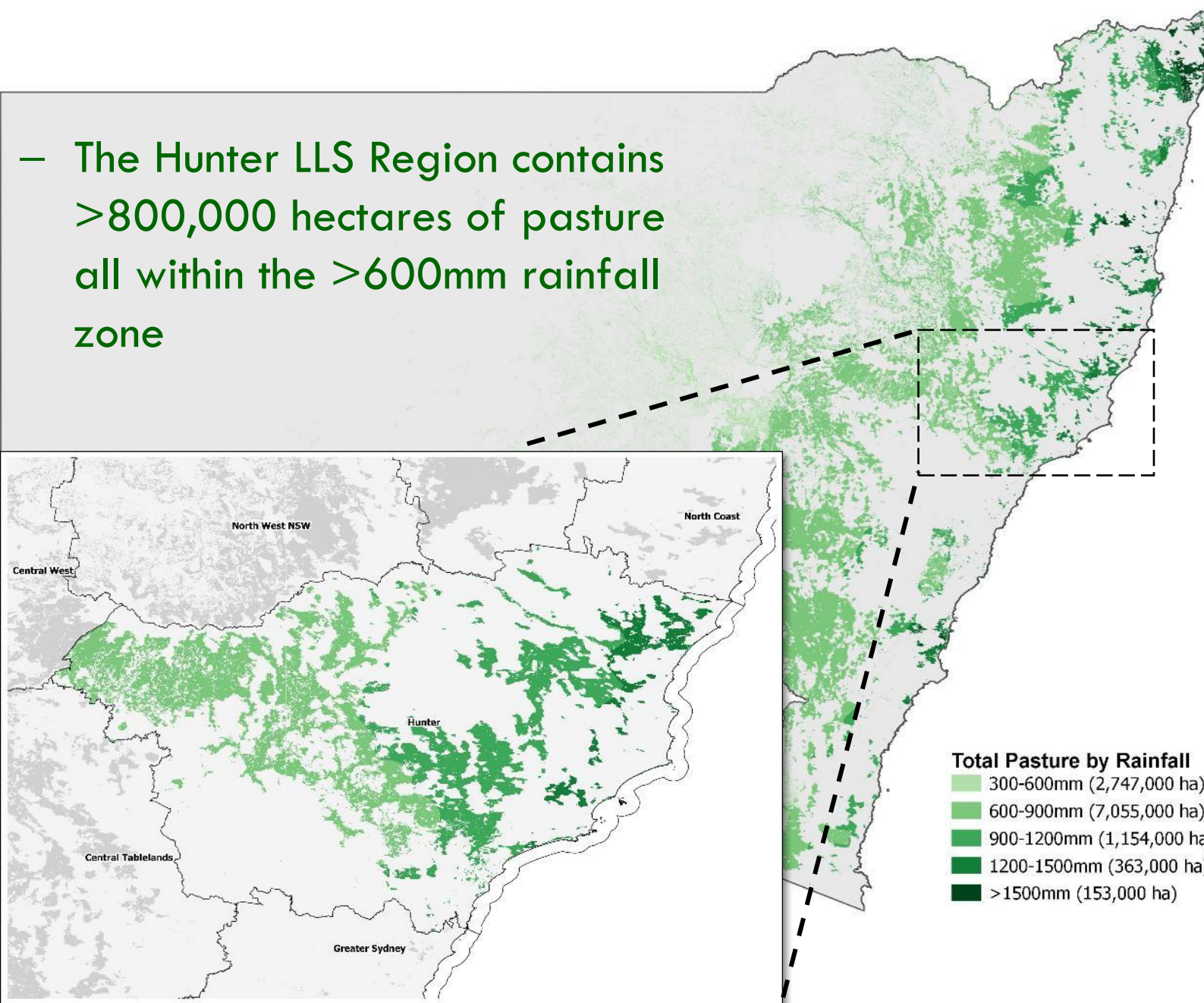
Rainfall (mm)	ha	ACCUs/ha	ACCUs/yr
300 – 600	8,375,000	3.0	25,125,000
600 – 900	15,745,000	5.0	78,725,000
900 – 1200	3,510,000	6.5	22,815,000
1200 – 1500	705,000	8.5	5,992,500
>1500	615,000	9.0	5,535,000
Total	28,950,000		138,192,500

Notes on Analysis:

- mean annual average rainfall data sourced from the Bureau of Meteorology www.bom.gov.au
- land use data sourced from the Dynamic Land Cover Dataset as accessed from Geoscience Australia www.ga.gov.au – excludes rangelands
- ACCU generation rates from internal AgriProve assessment using a 'Medium' projection 100% uptake
- total data should be taken as indicative and subject to validation.

NSW Pasture and SOC Potential

- The Hunter LLS Region contains >800,000 hectares of pasture all within the >600mm rainfall zone

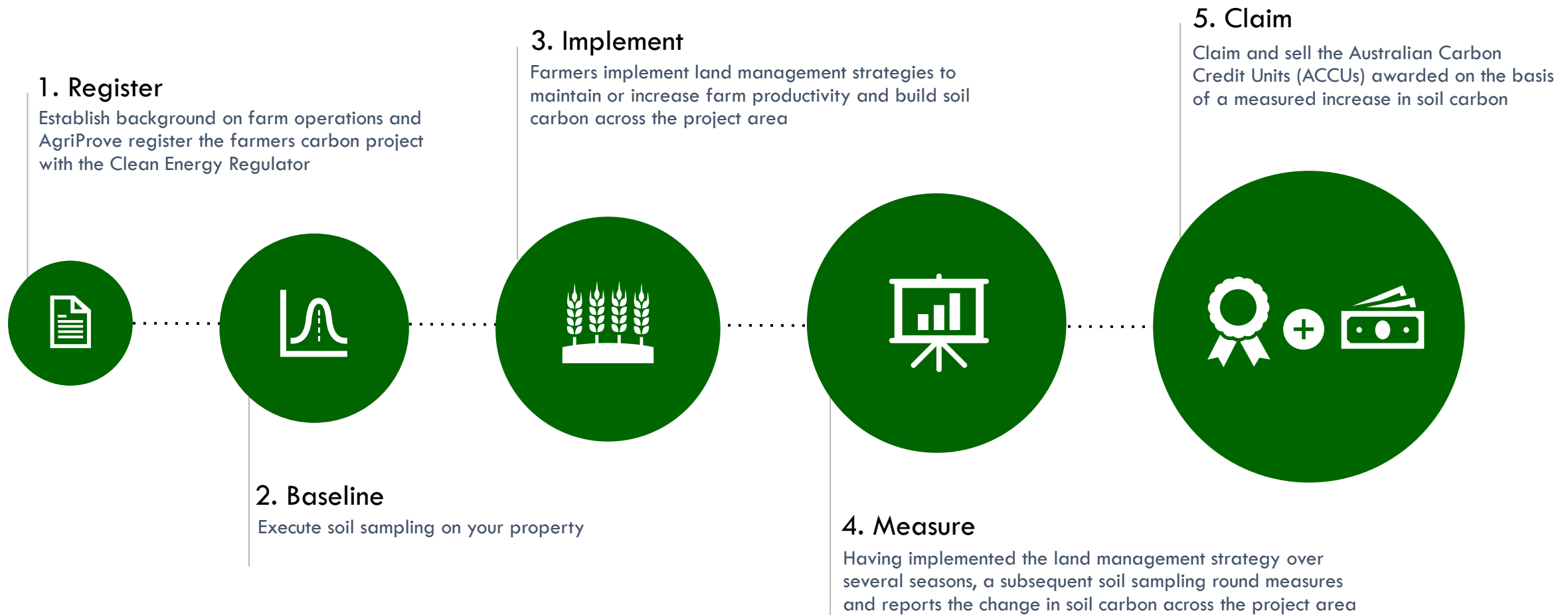


Potential for soil organic carbon sequestration by pasture land use and rainfall zone in New South Wales			
Rainfall (mm)	ha	ACCUs/ha	ACCUs/yr
300 – 600	2,747,000	3.0	8,241,000
600 – 900	7,055,000	5.0	35,275,000
900 – 1200	1,154,000	6.5	7,501,000
1200 – 1500	363,000	8.5	3,085,500
>1500	153,000	9.0	1,377,000
Total	11,472,000		55,479,500

Notes on Analysis:

- mean annual average rainfall data sourced from the Bureau of Meteorology www.bom.gov.au
- land use data sourced from the Dynamic Land Cover Dataset as accessed from Geoscience Australia www.ga.gov.au – excludes rangelands
- ACCU generation rates from internal AgriProve assessment using a 'Medium' projection 100% uptake
- total data should be taken as indicative and subject to validation.

5 steps to a soil carbon project





Input cost



Grazing



New Practices



Micro-organisms
Soil biota



Soil Carbon



N₂O



CH₄



MRV

CO₂ Revenue

Consent to Register

Begin by providing us with some basic contact information at the top of the first page. This will become the basis for our ongoing communication with you throughout the project. We may need to contact you on occasion via phone or email to confirm certain aspects of your carbon project, so please ensure the details provided are correct.

The following text indicates that you as the landholder agree to and understand the broad requirements of running a carbon project and provides AgriProve with the consent to act on your behalf with regard to your carbon project. This assignment of consent is a requirement of the registration process under the Emissions Reduction Fund (ERF). Please note however that signing this document does not lock you into an irreversible course of action. It simply signifies your agreement to pursue the development of a soil carbon project with AgriProve. You are free to discontinue your involvement at any point and we provide guidance on how to effect at different points in the project lifecycle.

CONSENT TO REGISTER AND UNDERTAKE CARBON EMISSIONS REDUCTION PROJECT

Name of farm	Email address
<hr/>	
Farm Address	
<hr/>	
Phone number	Landowner name
<hr/>	

Dear Sir/Madam,

As the owner of the farm identified above, this letter is to confirm our intention to work with AgriProve on carbon emissions reduction projects (either emissions avoidance or enhanced sequestration) on the farm with the goal of accessing the Emissions Reduction Fund (ERF).

As demonstration of this intent, the landholders hereby give consent to AgriProve Solutions Pty Ltd to undertake emissions reduction projects on the farm identified above for the crediting period of the project (25 years). This consent is exclusive for a period of 18 months from signing, and we confirm that no other party will be given the right to undertake an ERF project on our farm during this time. The continuation of this consent is conditional on a further decision to implement the projects, which will only be made once the final design of the projects have been established and commercial terms agreed.

We understand that if the project does proceed and creates Australian Carbon Credit Units (ACCUs) AgriProve Solutions will receive a share of the revenue from the sale of ACCUs to the Government as fee for services provided.

We understand that implementing a soil carbon project is an active commitment to improving soil health and building soil organic carbon. It requires new farm management activities to improve soil health and build soil organic carbon, as well as avoiding banned activities, such as bare fallow or application of 'off-farm' crop residue, hay, or straw, biochar, or soil amendments containing coal. These new activities will be documented in a Land Management Strategy for the farm.

We understand that soil carbon projects have land use eligibility criteria, and only those farm areas meeting these criteria can be included in the project. The attached information sheets provide information about past and potential new management activities of the farm that can be used to test these eligibility criteria.

Furthermore, we accept that our assistance with ongoing data gathering and administrative processes will be required to ensure compliance with project eligibility and reporting requirements of the Emissions Reduction Fund. Delays or errors in the provision of information could cause a reduction in the amount of carbon credits issued to the project, or to the cancellation of the project registration.

Yours sincerely,

<hr/>	<hr/>
(Signature)	(Signature)
<hr/>	<hr/>
(Name- Landowner 1)	(Name - Landowner 2)
<hr/>	<hr/>
(Address)	(Address)
Date: <hr/>	Date: <hr/>

Use the email and phone number that best suits you for regular correspondence as they will form the basis of our communication with you throughout the project.

To complete the registration process we need the signatures of the owner/ owners of the property indicated by the land titles on the following page.

Note: If the property is owned by a company we need the signatures of two directors or a director and a secretary of the company.



Client: Trethewey
Your Reference: Dunorlan House
Our Reference: O'Connor Carbon Project

Baseline (T0) Soil Sampling Plan

Date [08 November 2019]
Issue: 4

For your new project please consider and confirm

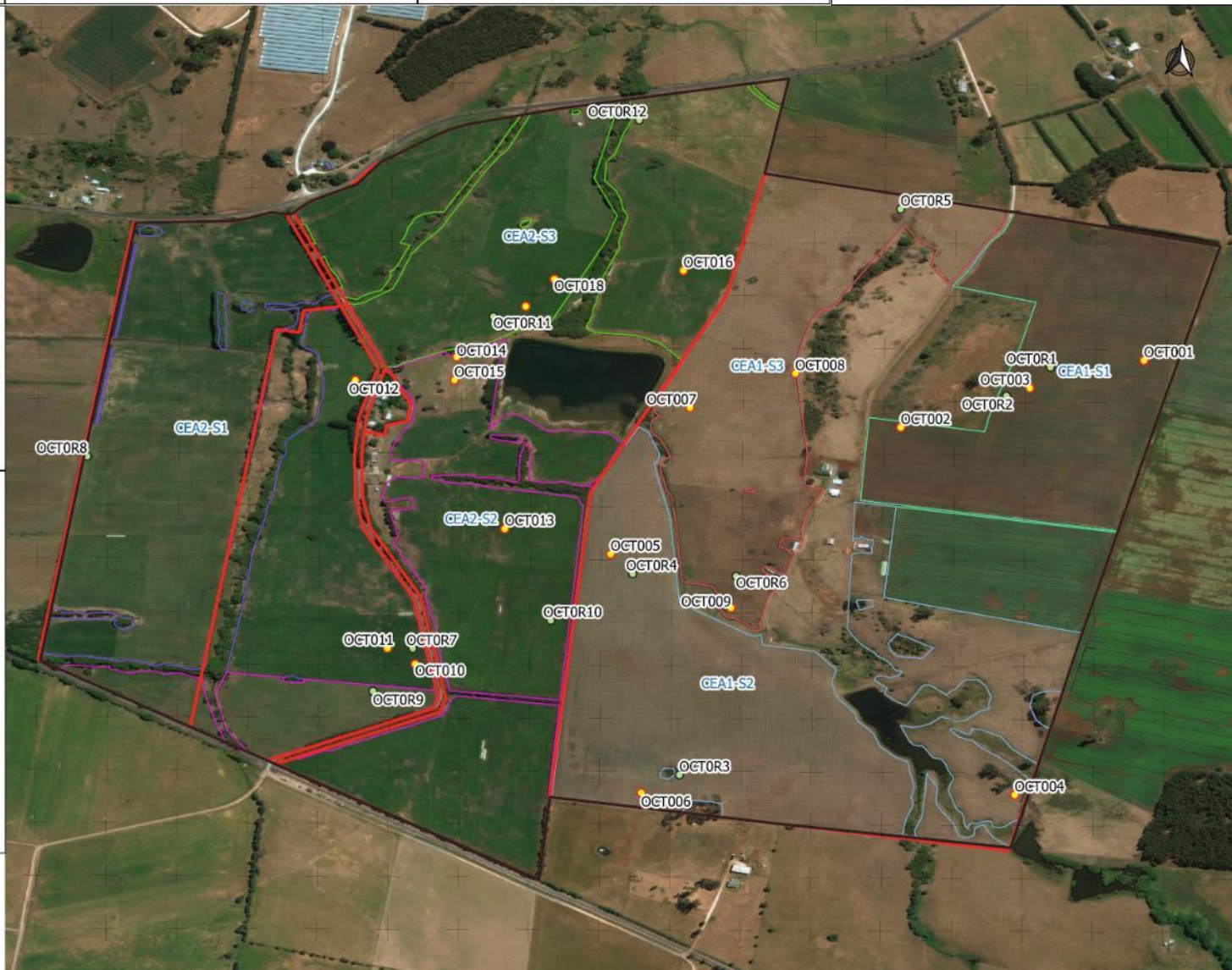
Are all project area included? Yes/No

Are any areas included where the new activity will not be carried out? Yes / No

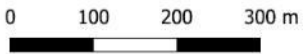
Are all obstacles such as buildings, dams, large trees, roads, steep slopes or other features that would prevent the new activity or soil sampling, excluded from the project areas? Yes / No

Are all sample points accessible by a vehicle? Yes / No

Soil sampling will be attempted to >1m. Are there any obstacles such as rocks or assets such as power, phone, gas, water or irrigation lines, which may affect sampling? Yes / No



- Sample Points
- Sample Points
 - Reserves points
- strata
- CEA1-S1
 - CEA1-S2
 - CEA1-S3
 - CEA2-S1
 - CEA2-S2
 - CEA2-S3
 - Project Boundary
 - Digital Cadastre



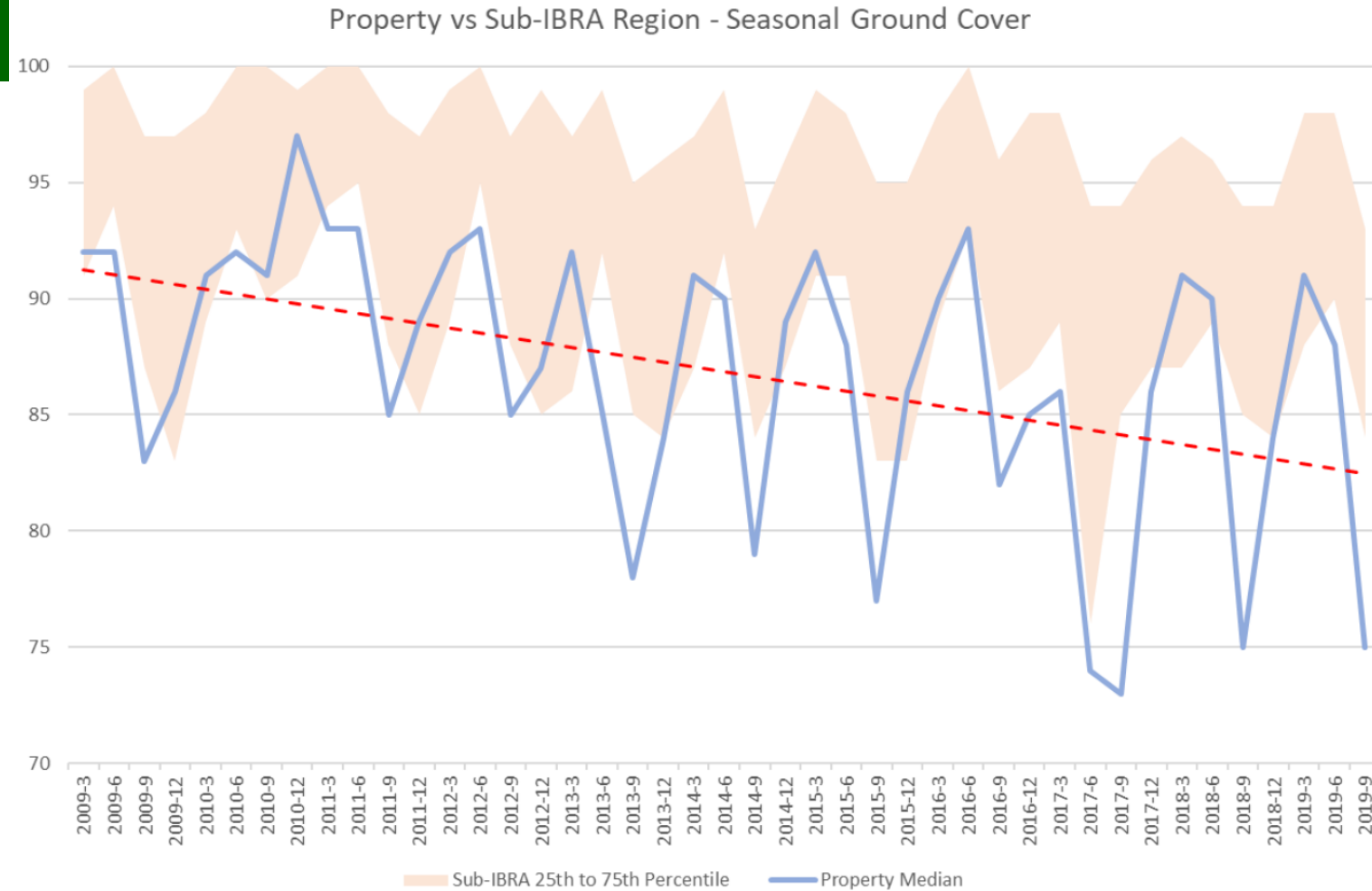
Land Management Strategy

Digital Agricultural Management for Carbon Sequestration – Grazing Systems:

- new or materially different to baseline condition report
- compost, forage, grazing activities are eligible
- satellite data updates to track progress, set sampling dates

Other LMS approaches for cropping under development.

Fractional Groundcover Baseline Condition Report EXAMPLE CARBON PROJECT

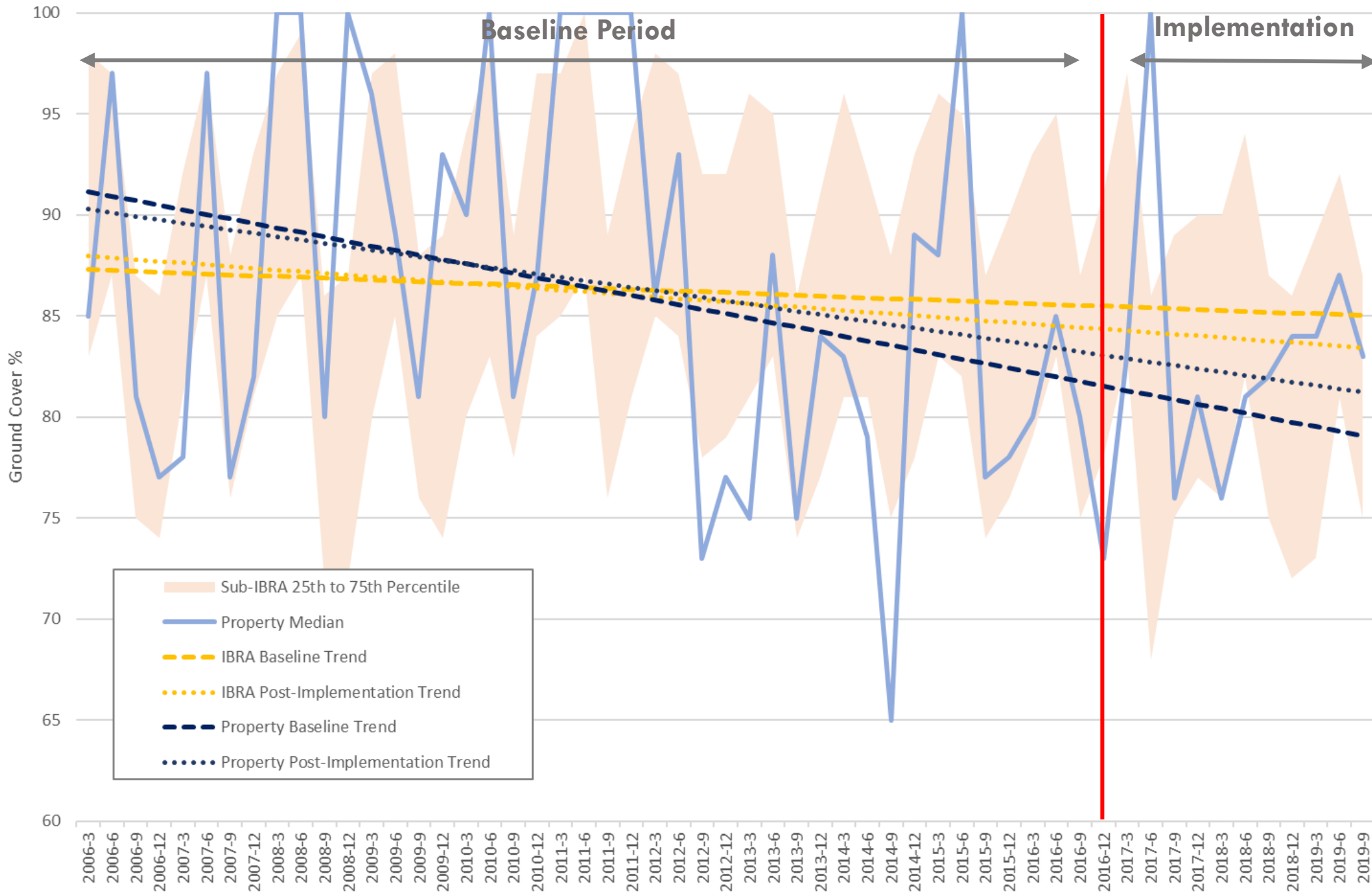


Minimum Groundcover Target

74.4%

Property vs Sub-IBRA Region - Seasonal Ground Cover - Baseline to Present

**‘Live’
Example**



- regional average constant in baseline — decreasing in project period
- project increases relative to baseline and relative to regional comparison



Forage as an example

Mixed forage species oversown into pasture. For example:

- Peas, Sunflowers, Buckwheat, Benatas Vetch, Oats, Tillage radish, Leafy Turnip, Italian Rye Grass, Crimson Clover, Hamua Clover, Lusa Clover, Millet, Corn/maize, Phacelia and Linseed.

Aim is to increase quantity and quality of feed, and increase organic matter in soil. (Also other options!)



Subsequent rounds

Soil carbon credits are only issued on a measured increase in soil carbon:


- next round testing 2-5 years after baseline
- cost a factor – farmer pays for soil testing:
 - \$5,000 for 200 hectares
- credits calculated on change in soil organic carbon since last sampling round:
 - measured on trendline (linear regression)
 - variance a factor.



AUSTRALIAN CARBON CREDIT UNIT

Soil carbon credit unit no#1

credited under the Emissions Reduction Fund to
Matthew Warnken, Director of Corporate Carbon
for the Grounds Keeping Carbon project.


David Parker
Chair, Clean Energy Regulator

Claim soil carbon credits

Project offsets report and application for credits:

- change in soil organic carbon stock levels
- less increased emissions (from baseline) and less permanence discount (25 years – not 100)
- works as a ratchet – no handing back (no issuance until over previous high level mark)
- 1% point increase in top 30cm = 125 ACCUs
- good performing projects can expect \$50 - \$100 per hectare revenue each year
- first application is always audited.

First soil carbon credits awarded in Australia



Project offsets report and application for credits:

- 1 year between baseline and first subsequent round of measurements
- First issuance of soil carbon sequestration ACCUs in Australia
- Two successful rounds of ACCU issuance
- First round was 12.2 tCO₂e/ha
- Second round was 13.7 tCO₂e/ha
- In total 19.4 ACCUs per hectare
- Continued monitoring and resampling will produce new claims for ACCUs

Partnering with AgriProve

- working with over 200 farmers
- streamlined ‘no regrets’ approach to registration
- success fee – no credits no fees
- baselining only cost (we cover all audit costs)
- options on sale of carbon credits
- developing specific forage seed mixes for planting in spring
- Soilkee for demonstration and trial hire.





Niels Olsen - Soilkee

Soilkee – Why was it developed?



Soilkee – What's different about Soilkee?



Soilkee – Technical specifications and functionality



Soilkee – How to build soil carbon and pasture productivity using Soilkee?



Building carbon rich topsoil for increased pasture performance in the Hunter Region with Soilkee

DUNGOG – GRESFORD

LAND & BEEF INC

Promoting Sustainable Land & Beef Management

Hunter Dairy Development
Group



National
Landcare
Program



This project is supported by Hunter Local Land Services, through funding from the Australian Government's National Landcare Program.

Aims

- 1) apply the Soilkee pasture renovation approach over 2 years:
 - a multi-species annual pasture mix for winter feed
 - a perennial pasture mix on the poorer soil types on low slopes
- 2) increase understanding of the role of soil biology
- 3) investigate the potential for Carbon credits

Things we are measuring

- Soil carbon
- Pasture biomass (kg DM)
- Pasture quality (crude protein, ME)
- Soil chemistry (pH, total and available nutrients)
- Soil biology (glomalin)

4 trial sites

1 x alluvial flats

Suellen

1 x low slope (away from the waterway)

Suellen

1 x mid slope

Murray

1 x mid slope (level land)

David

Each trial site: 5 plots @ 6m x 25m

1 m gaps between (control)

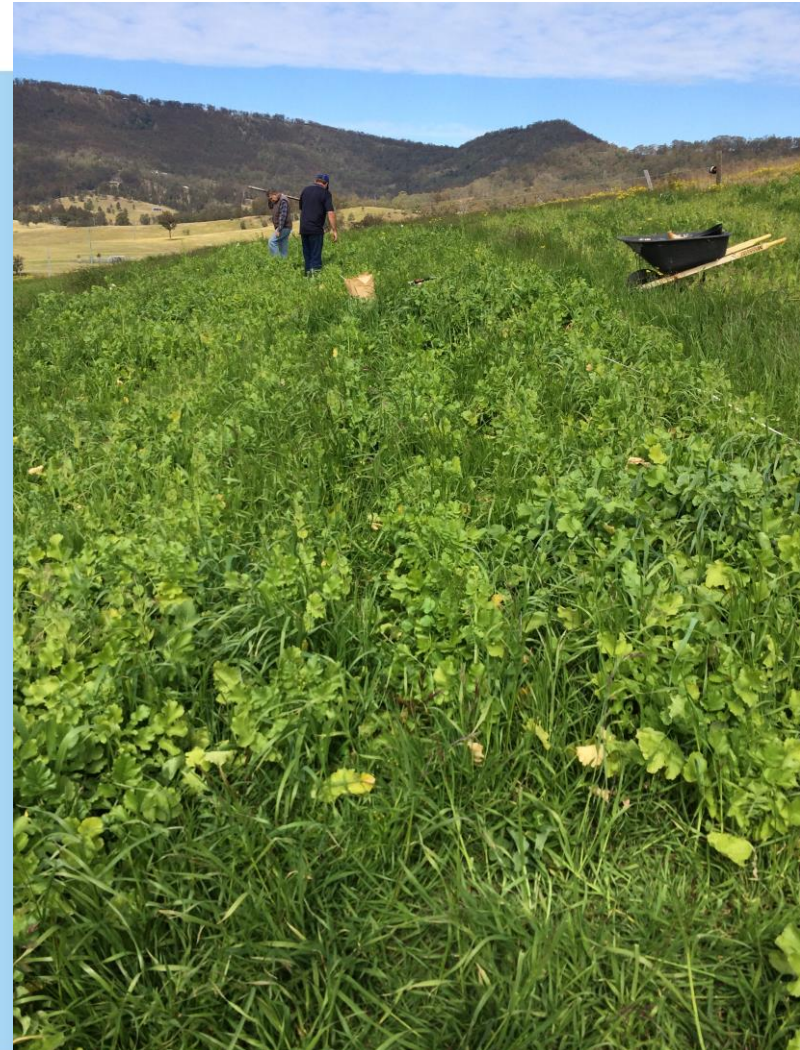
Lots of combinations of factors

- Soilkee and farmer's seeder
- 6 and 10 multi species annuals
- Perennial species
- Fertiliser
- Biological inoculant

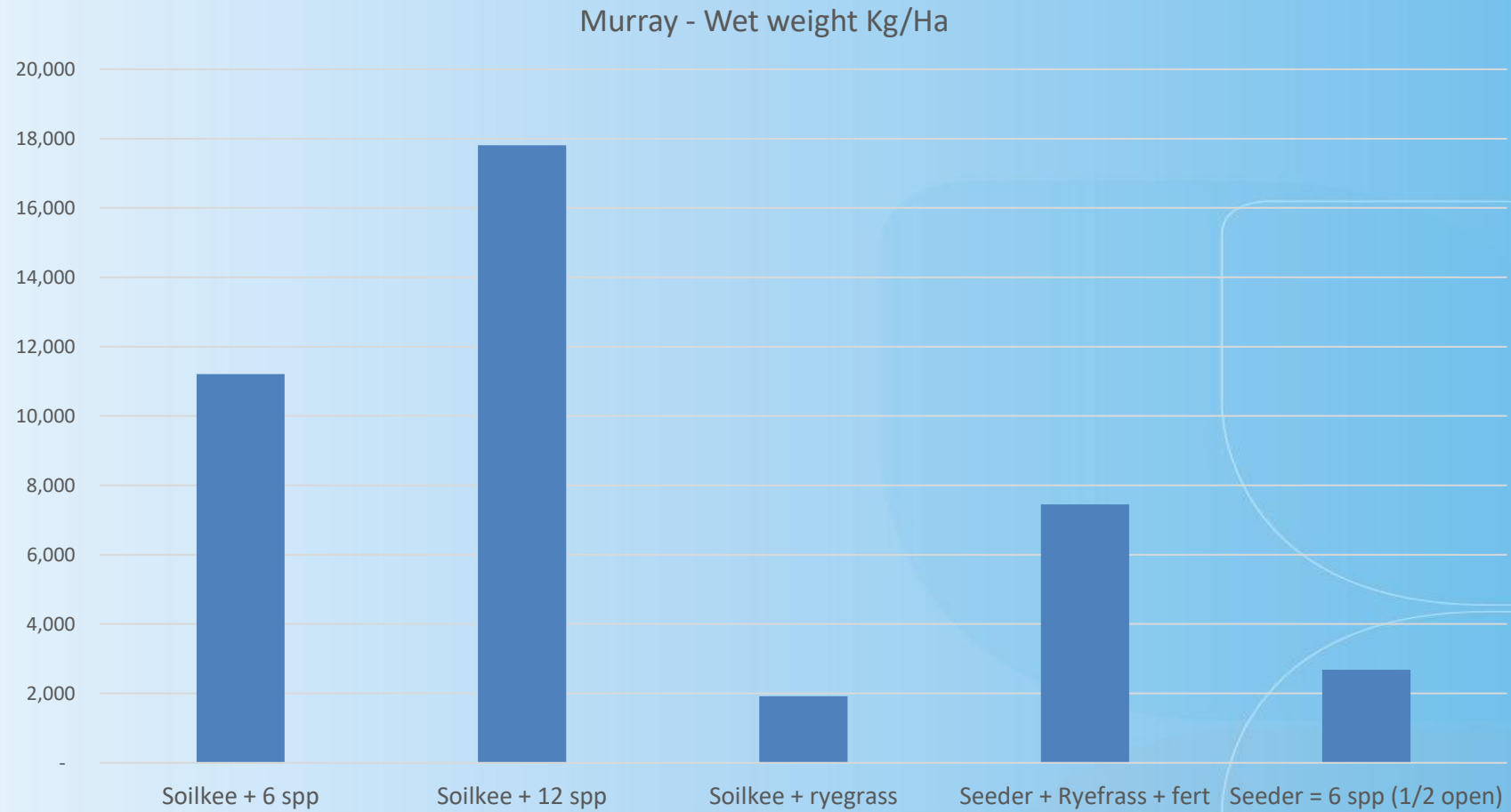
Carbon sampling to 30 cms



Murray



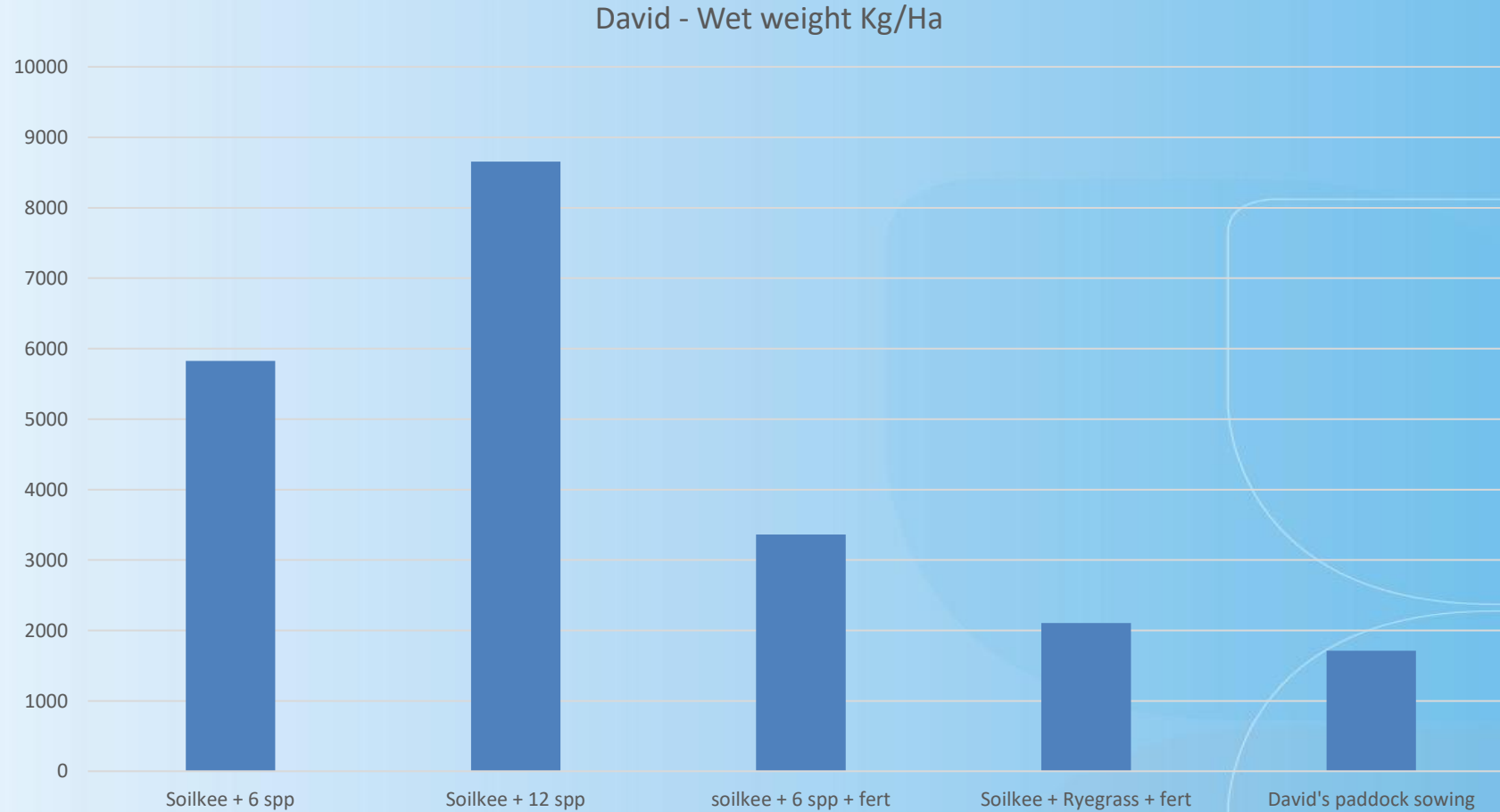
Murray – wet weight



David



David – Wet weight



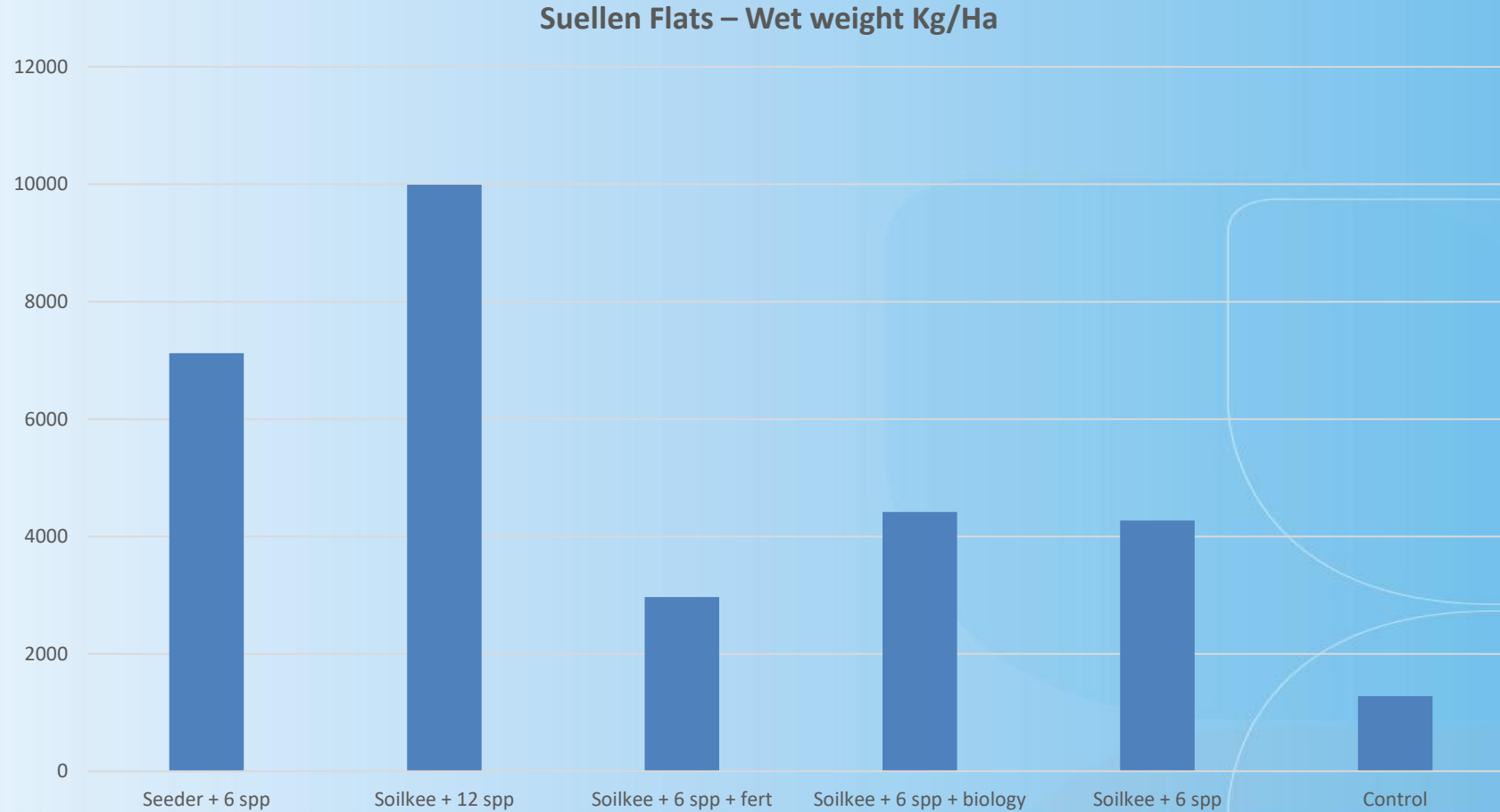
Suellen flats



Suellen flats: 42 days, variability within plots



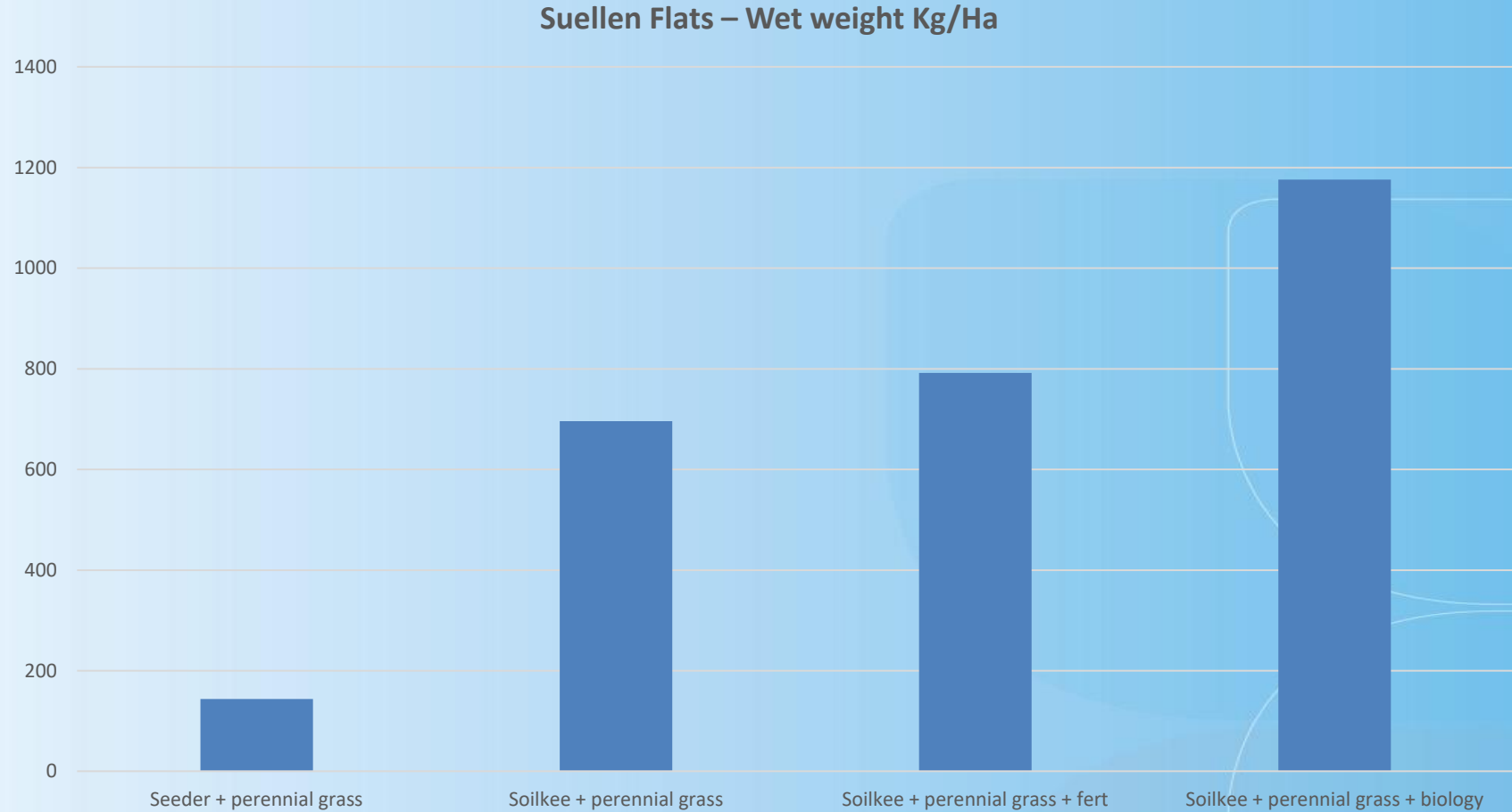
Suellen – Flats – Wet weight



Suellen Shed paddock



Suellen – Flats - Wet Weight



Next steps

- Confirm the next sowings (spring/summer; autumn)
- Maybe a Tocal College trial plot
- Field days (covid?)
- More measurements
- Collation and write-up in 2022

Holistic Approach – Using Soilkee as a Tool to Build Soil Carbon - Bob Doyle

- 6th generation farmer on Eden Vale
- Paterson Valley NSW
- Dairy farmers until 2007
- Active in Landcare since 1990 (Inaugural President)
- Growing industrial hemp since 2009
- 1830's to 1980s - significant decline in soil carbon



Hatred of water running off paddocks

- The Paterson River is the most reliable regulated River in NSW
- Yet irrigation is expensive
- Historically we used to have significant runoff
- 50mm of rain can see a rise in the River
- The Aim - every bit of rain is to soak into the soil where it falls.

Capturing that rain...

- Grows more grass
- Increases soil carbon
- Improves the biological health of the soil
- Reduces our need for irrigation
- Improves our dry weather and drought resilience
- Has been a slow process except where a number of techniques have been implemented

Increasing productivity across the whole farm

On our farms we use many techniques to increase soil carbon

- Rotational dairy grazing since the 1950's
- Holistic grazing
- Fertiliser application
- Deep Tillage
- Keyline
- Minimal cultivation
- Improved species
- Food waste injection
- Industrial Hemp Fibre Crops
- Fencing biodiversity areas from stock
- Natural Sequence Farming
- Trialing the Soilkee

Soil Carbon Credit Opportunity

- Over the last 40 years we have been increasing soil carbon by default
- The increases have been steady with some exceptions
- Are we too late to consider soil carbon credits???
- In June the Soilkee machine was brought into the district

Soilkee Trial Commenced



Why Soilkee?

- Niels is the first to achieve credits under the Paris Agreement
- The LLS has brought the Soilkee to the HV – this affords us opportunity
- So:
 - Do you deep rip or not?
 - Is it expensive per hectare?
 - Is it the Soilkee or the multiple species?
- Measuring results are critical

We must continually strive to improve our sustainability



Pasture versus cropping

- A lot of challenges.....
- We have had permanent based pastures for 35 years
- Growing crops is a challenge – for us, this is hemp fibre and grain
- Our hemp fibre crops must be pesticide free if the hurd is used in housing
- So - increasing soil carbon is a good measure of our sustainability

The challenges of increasing soil carbon with cropping



A house built from industrial hemp hurd grown on Eden Vale is locking up carbon



Does the Soilkee have a place at Eden Vale?



Where to?

- Role of multiple species
 - Brassicas
 - Legumes
 - Cereals
 - Grass
 - Chenopods
- The C : N ratio and maintaining high soil C
- Use of pesticides
- Soil microbiology
- Our farm carbon emissions
- Loss of independent sources of information
- Measure

Where to – continued....

- Can all landscapes build carbon?
- Minimum size?
- Risks of not maintaining earned credits?
- Is the 25 year contract a risk or opportunity?
- How does that impact on succession?
- Understanding the different types of carbon
- The links between soil health, environmental health and human health





**Thank you
for more information contact**

Kieren Whittock

+61 400 216 548

1300 GO SOIL (46 7645)

team@agriprove.io

www.agriprove.io