



# Carbon farming to improve production and reduce greenhouse gas emissions

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@WANTFA\_Carbon

CARBON FARMING EXTENSION AND OUTREACH PROJECT



**wheatbelt**  
natural resource  
management

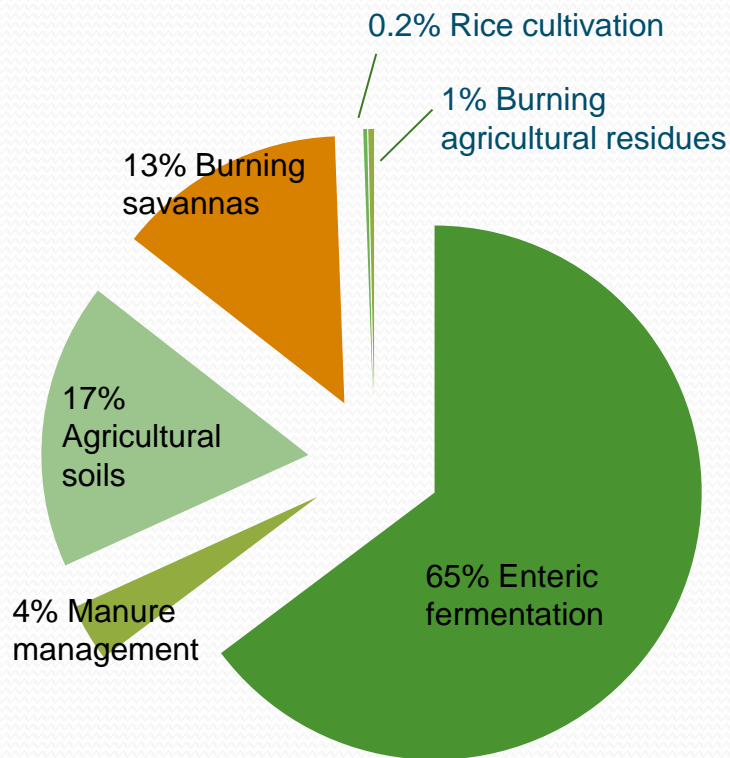
This project is supported by funding from the Australian Government

# What is carbon farming?

The capture and storage of carbon in vegetation and soil or reducing greenhouse gas emissions from agricultural practices



# Greenhouse gas emissions from agriculture



## Agriculture contributes:

- 16% of all Australia's GHG
- 58% of all methane production (or 10% of national GHG emissions)
- 86% of all nitrous oxide production (or 3% of national GHG emissions)

# Global warming potential CO<sub>2</sub>-e

- Carbon dioxide – CO<sub>2</sub> 

- Methane – CH<sub>4</sub> 

- Nitrous oxide – N<sub>2</sub>O 

# On farm sources of GHG emissions

- Fuel usage CO<sub>2</sub>
- Cultivation CO<sub>2</sub>
- Soil Organic Matter CO<sub>2</sub>
- Crop residue breakdown CO<sub>2</sub>
- N application N<sub>2</sub>O
- Burning stubbles N<sub>2</sub>O CH<sub>4</sub>
- Biological N fixation N<sub>2</sub>O
- Waterlogging CH<sub>4</sub>
- Livestock emissions CH<sub>4</sub>
- Manure management CH<sub>4</sub>

# What can you do as carbon farmers?

- Understand soil condition and constraints
- Adjust fertiliser application
- Manage soil compaction in paddocks
- Use different crop rotations
- Plant areas of unproductive land to sequester carbon
- Summer cropping
- Control waterlogging in paddocks
- Change livestock management



# Adaptation and mitigation

**Adaptation:** Actions undertaken to reduce the adverse consequences of climate change, as well as to benefit from any opportunities.

Aim to reduce the risks and impacts of climate stresses  
Changing what we do, to get what we want

**Mitigation:** Reduce the magnitude of our contribution to climate change.

Mitigation refers to strategies to reduce greenhouse gas and enhance greenhouse gas sinks.

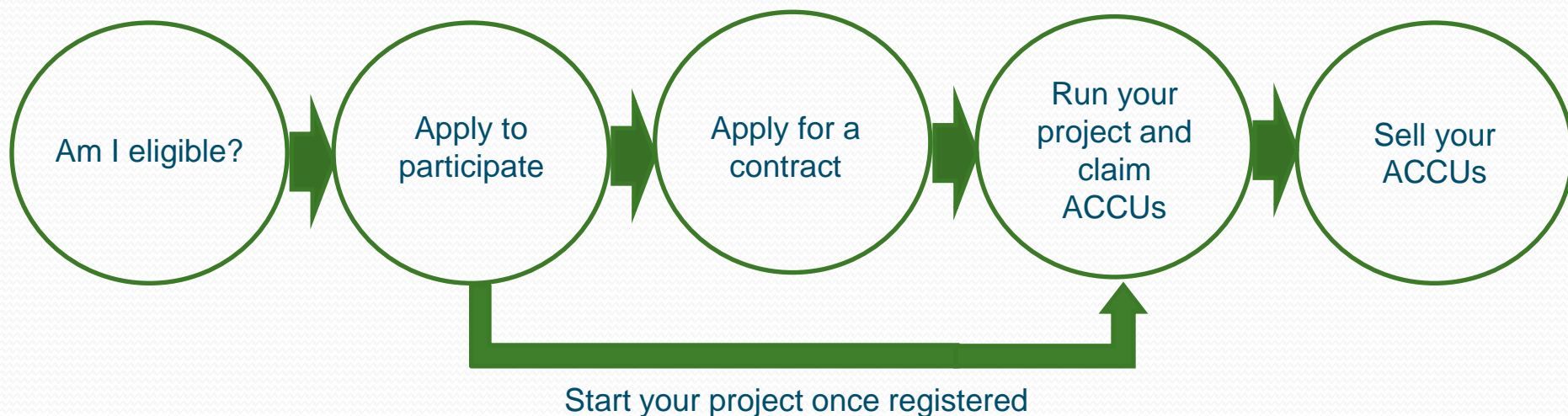
# Emissions Reduction Fund

- Australian Government's plan to efficiently and effectively source low cost emissions reductions
- Designed to reduce greenhouse gas emissions and store carbon in soil and vegetation.
- 1 tonne of CO<sub>2</sub> -e reduced = 1 ACCU (Australian Carbon Credit Unit)
- ACCUs can be sold at auction or privately into the secondary market
- ACCUs can be an extra source of income





# Participating in the Emissions Reduction Fund



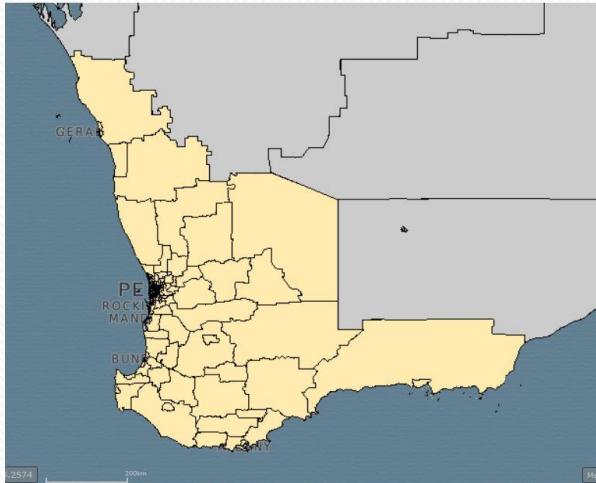
# Soil Carbon Method

## Project management activities in soil carbon projects

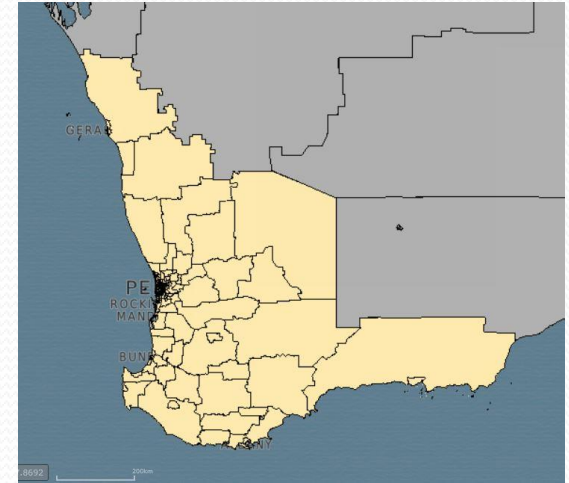
A soil carbon project must involve at least one of these *project management activities*:

1. ***Sustainable intensification*** involves at least 2 of the following management actions  
(a) nutrient management; b) soil acidity management; (c) new irrigation; (d) pasture renovation.
2. ***Stubble retention*** involves undertaking the management action of retaining stubble in a carbon estimation area after a crop is harvested.
3. ***Conversion to pasture*** involves undertaking the management actions of establishing and maintaining pasture in a carbon estimation area.

## Stubble Retention Map



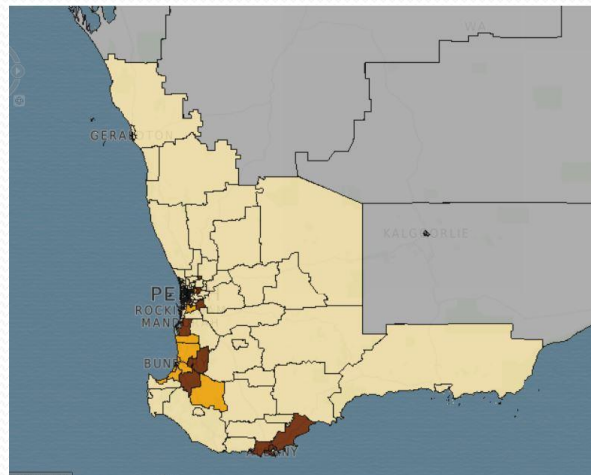
## Sustainable Intensification Map



**CF  
Mapping  
Tool**

-  Marginal benefit (yellow)
-  Some benefit (orange)
-  More benefit (brown)
-  Ineligible land

## Conversion to Pasture Map



# Sequestration Values from FullCAM modelling

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Project Management Activity	Not Modelled	Sequestration value tCO <sub>2</sub> e/ha/year		
	1.0 Ineligible land Grey	1.1 Marginal benefit Yellow	1.2 Some benefit Orange	1.3 More benefit Brown
Conversion to pasture	No value	0.22	0.44	0.84
Stubble retention	No value	0.07	0.29	0.73
Sustainable intensification	No value	0.11	0.59	1.65

# Carbon Payments for Soils Method

## Sustainable intensification activities

SA2 Region on CFI map	Sequestration Value	Price (t/CO <sub>2</sub> -e/yr)	\$/ha/yr
Yellow	0.11 tCO <sub>2</sub> -e/ha/yr (0.03 tonne C/ha/yr)	\$13.95	<b>\$1.53</b>
		\$7	<b>\$0.77</b>
Orange	0.59 tCO <sub>2</sub> -e/ha/yr (0.16 tonne C/ha/yr)	\$13.95	<b>\$8.23</b>
		\$7	<b>\$4.13</b>
Brown	1.65 tCO <sub>2</sub> -e/ha/yr (0.44 tonne C/ha/yr)	\$13.95	<b>\$23.02</b>
		\$7	<b>\$11.55</b>

# Carbon Payments for Soils Method

## Conversion to Pastures

SA2 Region on CFI map	Sequestration Value	Price (t/CO <sub>2</sub> -e/yr)	\$/ha/yr
Yellow	0.22 tCO <sub>2</sub> -e/ha/yr (0.06 tonne C/ha/yr)	\$13.95	<b>\$3.07</b>
		\$7	<b>\$1.54</b>
Orange	0.44 tCO <sub>2</sub> -e/ha/yr (0.12 tonne C/ha/yr)	\$13.95	<b>\$6.14</b>
		\$7	<b>\$3.08</b>
Brown	0.84 tCO <sub>2</sub> -e/ha/yr (0.23 tonne C/ha/yr)	\$13.95	<b>\$11.72</b>
		\$7	<b>\$5.88</b>

# Carbon Payments for Soils Method

## Stubble Retention

SA2 Region on CFI map	Sequestration Value	Price (t/CO <sub>2</sub> -e/yr)	\$/ha/yr
Yellow	0.07 tCO <sub>2</sub> -e/ha/yr (0.02 tonne C/ha/yr)	\$13.95	<b>\$0.98</b>
		\$7	<b>\$0.49</b>
Orange	0.29 tCO <sub>2</sub> -e/ha/yr (0.08 tonne C/ha/yr)	\$13.95	<b>\$4.05</b>
		\$7	<b>\$2.03</b>
Brown	0.73 tCO <sub>2</sub> -e/ha/yr (0.20 tonne C/ha/yr)	\$13.95	<b>\$10.18</b>
		\$7	<b>\$5.11</b>

# Want to know more?

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