

Management options

Climate clever beef

Cattle producers have a strong vested interest in improving the efficiency of greenhouse gas emissions efficiency in their herds. It's called productivity.

The MLA-supported Climate Clever Beef program aims to build the profitability of beef enterprises and their resilience to changes in climate and markets.

Run across six regions in Queensland and the Northern Territory, the project is showing that working towards increases in productivity and profitability can go hand-in-hand with reducing greenhouse gas emissions—and vice versa.

Climate Clever Beef is supported by the Australian Government Department of Agriculture, Fisheries and Forestry's Climate Change Research Program. It's led by Steven Bray from the Rockhampton office of the Queensland Department of Employment, Economic Development and Innovation (DEEDI). →

Snapshot

Alan and Penny Wallace,
Clarke Creek, Qld.



Property:
3,830ha

Enterprise:
Beef cattle
breeding, Red
Brahman stud

Target market:
Heavy slaughter
cattle to
Teys Brothers,
Rockhampton

Livestock:
1,200 breeders
and followers

Pasture:
Native, semi-
improved and
improved
grasslands with a
tropical legume

Soil:
Mostly heavy
brigalow soils,
some alluvial creek
and black soil

Rainfall:
650mm



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“On nearly every property we’ve looked at, there are management options that simultaneously increase profit and adaptation to climate change as well as reducing livestock methane emissions,” Steven said.

Grazing land management and soil health

A group of seven central Queensland landholders who are proud of their land management and interested in seeing how their work was reflected below ground volunteered to be part of a Climate Clever Beef study at Clark Creek looking at soil health.

The results intrigued Alan and Penny Wallace, who have owned their 3,830ha beef cattle property, ‘Clive’, for 11 years.

“Managing for the triple bottom line has always been important to us, and we’re interested in how we can improve our resilience to climate change,” Penny said.

“We are always going to have droughts and floods, and we want to know whether we can better manage for them.”

Soil sampling on Clive showed a generally good relationship between how country is managed and levels of soil carbon.

The Wallaces have maintained high levels of soil carbon in areas where healthy pasture has been maintained, a finding that was consistent across the Clarke Creek study.

In one comparison, topsoil (0-10cm) was sampled in one paddock that was sown straight to buffel grass after development and in a neighbouring paddock that was cultivated following development and colonised with buffel grass over the past 11 years. Cultivation is well known to significantly reduce soil carbon and soil health.

Both paddocks are currently in good condition, but in the uncultivated paddock pasture



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1. Alan and Penny Wallace are working on strategies to improve their resilience to climate change.

2. The 3,830ha property includes a Red Brahman stud.

3. The Wallaces are interested in the role legumes may play in combating pasture rundown and maintaining soil carbon levels.

yield was measured at 5,040kg/ha with 1.9% soil carbon, compared to 4,470kg/ha pasture and 1.6% soil carbon in the cultivated paddock.

Microbial activity and microbial diversity were similar, pointing to recovery of the cultivated paddock.

A second assessment on flooded brigalow country compared a developed grass paddock to uncleared brigalow forest.

Livestock productivity was much higher in the pasture paddock, which has a pasture yield of 4,740kg/ha compared to 1,070kg/ha in the uncleared brigalow forest.

But surprisingly, soil carbon was the same –2.85%–and microbial activity was similar. This suggests that current grazing management is sustainable.

“One of the things we wanted to prove was that grazing the country and looking after it was no different to keeping it native.”

“This study seems to have shown that’s the case.”

Steven said the findings showed that under sustainable grazing management, soil carbon storage in grass pastures could be maintained at–or close to–pre-clearing levels while maintaining grazing productivity.

However, Steven added that soil carbon wasn’t straightforward.

At the Wambiana grazing trial, south of Charters Towers, soil carbon levels for two land types (brigalow and silverleaf ironbark) were lower under a heavy grazing regime, while the box land type had higher soil carbon under a heavy grazing regime. That’s a puzzle scientists are still trying to understand.

The Wallaces regard themselves–and the other six landholders in the group–as conservative stockers and progressive managers as seasons and markets allow. Alan said compared to many brigalow holdings, the Clarke Creek blocks were small (4,000–5,600ha), which makes the landholders wary of pushing their country too hard.

The Wallaces strategically spell their paddocks, and aim for a burn across their pastures every 6–7 years. Like most of the district’s landholders, they have experimented with tropical legumes; others have planted leucaena.

They are interested in the role legumes may play in combating pasture rundown and maintaining soil carbon levels, which has them wondering how they can increase their legume content.

Alan said it was largely a management issue. Legumes are sown down on ‘Clive’, but are sought by stock and grazed hard.

Fast facts

→ There is generally a good relationship between land condition, the productivity of a grassland and levels of soil carbon.

→ However, the relationship with soil carbon levels can be variable depending on soil type.

→ There can be little or no difference in soil carbon levels between improved grassland and uncleared native vegetation, indicating that good grazing management can be sustainable.

Seven strategies for increasing productivity while reducing emissions.

Adaptation measures:

→ managing stocking rate for optimum productivity

→ wet season spelling to allow pastures to reach greater maturity before being grazed

→ prescribed burning for woody vegetation management

→ better distribution of grazing pressure through fencing and watering points

Mitigation strategies:

→ increased breeder herd efficiency (more calves per unit of methane)

→ higher diet quality (more beef per unit of methane)

→ managing woody regrowth to sequester emissions in vegetation without affecting productivity



Discover more about Climate Clever Beef...

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Check out MLA’s Feed Demand Calculator to optimise feed use and plan for feed gaps
www.mla.com.au/tools