



Carbon Grazing

The Missing Link

Improving plant & landscape resilience

Re-carbonise the soil for profit

De-carbonise the atmosphere

Reduce methane emissions

Alan Lauder

www.carbongrazing.com.au

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Carbon Grazing® is a general principle to maximise the introduction of carbon from the atmosphere into the landscape between the trees. Those who implement Carbon Grazing should enhance their economic return and achieve positive environmental outcomes including methane reduction.

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CHAIRMAN'S FOREWORD

Southwest NRM is a community-based public company and the designated regional natural resource management body for South West Queensland. As such, we foster ethics of landcare and sustainability. My Directors and staff were so impressed with the importance of the book's message and the quality of the writing that we are providing a complimentary copy to every rural landholder within the region.

The author Alan Lauder was long a respected pastoralist within the South West region of Queensland, based at his property "Woodstock", Cunnamulla. He is well known for his advocacy of Old Man Saltbush as a fodder reserve and critical ingredient in the mix of species available for his animals. This was borne out by his stock which always performed well, even during the long dry of the 1990s.

However, this is not a book about Old Man Saltbush, nor is it applicable only to the mulga lands of South West Queensland. This is a book written by a landholder for landholders. The appeal of the book lies in the simplicity of the language in which Alan has expressed highly complex scientific principles. His skill lies in assembling knowledge from a broad range of scientific disciplines, which tend to publish their own findings in specialised journals. Alan then uses this knowledge to explain how the atmosphere, soil, vegetation and the other components of the land operate as unified natural systems.

Alan's timing in publishing this book could hardly be better matched to the rapidly advancing agendas of climate change and water scarcity. He emphasises that graziers should aim to store carbon in the soil through better management of grazing animals and pastures. This is not necessarily because it will be profitable in the emerging carbon trading markets, but rather as it is the correct, corporate socially responsible thing to do.

Both the author and publisher have taken comprehensive steps to ensure that the science and scientific principles discussed in this book adequately represent those of peer-reviewed publications. To achieve this, the book's themes were independently reviewed by a range of experts in various fields, and the book in its entirety was critiqued by a scientific consultant.

It is acknowledged that some fields of research, including climate change, are rapidly evolving sciences. However, we are confident that the fundamental themes described in the book will be more than validated over time.

The principle of Carbon Grazing as a holistic approach to land management and commercial agriculture is new to Australia and as such will be the subject of further discussion, research and improvement over the years ahead.

This book is a story. It is the story of one highly perceptive observer's journey of discovery through field observations and scientific knowledge. It represents the opinions of the author and ultimately the author's experience and interpretation of the landscape, of science and society.

South West NRM is delighted to have sponsored the publication of "Carbon Grazing – the missing link" and commends it to you.



Tom Garrett
Chairperson Southwest NRM LTD



PREFACE

Welcome to an unusual book! a book written by a Queensland grazier-ecologist. This book is the result of a life time of making simple observations in the paddock and asking, 'Why?'

"... why is it easier to hit a steel post into the middle of where a perennial grass plant is growing, than between them in areas of hard and capped soil?"

The answer to this profound question is this book. The answer is based on many years of conversations with scientists like myself. These conversations have been based on many hours of phone calls (some at 6 am!), emails and reading. These scientific 'conversations' have been repeatedly tested against Alan Lauder's careful eye in the paddock and against his property's balance sheet.

The result is a journey that produced this book with a strange title. Alan's quest to answer 'why' has led to the pathways of carbon – the essence of life. In this book Alan takes the reader from the fundamentals of photosynthesis to how precious rainfall flows into carbon rich soil, the resulting plant growth, animal production, and the need to prepare pastures for the next inevitable dry spell.

Alan has the great ability to think across scales from the molecules involved in carbon fixation, the green pick needed for sheep and cattle digestion, to the global challenge of climate change. This ability has produced many gems of practical wisdom such as "The landscape must be managed so that it can withstand whatever the hard times throw at it, be they wet or dry. Indeed in Australia it is the extremes that determine the norm."

Thank you Alan.



Dr David Freudenberger

Director of Science and Major Projects
Greening Australia
(Former CSIRO rangelands scientist)

ACKNOWLEDGEMENTS

This book is an accumulation of more than 30 years of my life and experiences.

Therefore I must initially thank my parents for giving me the opportunity to experience farming and grazing in south-west Queensland first hand. My brothers, my children Rebecca and Robert, as well as my partner Pam Dixon have supported me in all my endeavours, including the time spent on compiling this book, for which I will be eternally grateful.

The following people have contributed their time, experiences, expertise, practical knowledge, opinions and ideas which have guided the compilation of this book. I owe much to them in supporting me to achieve the goal of finalising the book.

Allan Wilson
Beverley Henry
Brian Roberts
Bruce O'Meagher
Carolyn Ditchfield
David Freudenberger
Geoff Edwards
Grant Stone
Greg McKeon
Ian Greenhalgh
James Nason
John Carter
Ken Hodgkinson
Mike Wilson
Murray Wingett
Pat Francis
Peter Milthorpe
Stuart Dodds
Warwick Jones

I would also like to especially thank Annette Sugden for her inspiration and support over many years in encouraging me to bring my ideas into the public domain.

Finally I owe special thanks to my business associates Neale Price and Karen Rosner who have worked tirelessly with me over the years to question, challenge, review, revise, edit and finally prepare this book for publication.

FOREWORD

In the real world, people have to make a living, so debates need to keep this in mind. The other parameter is that functional landscapes are more profitable. By taking a broader approach to science, the solutions proposed in this book cater for the needs of rural producers and the rest of society.

At the end of the day, it is rural producers who are the custodians of much of the landscape. It is their actions that determine the health of the landscape, with nature often a helpless bystander. When producers have the right philosophy or legislation encourages them to work with nature, then we are all the winners. Practical solutions are often based more on knowledge than expensive capital outlays. Life always comes down to, what's in it for me? By the end of the book, I would like to think that there is something in it for everybody in society.



"The problems of today cannot be solved by the level of thinking that caused them."

Albert Einstein

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INTRODUCTION

Managing a rural operation is like rearing children. We all start off inexperienced and by the time it all makes sense, it is all over. Then history repeats itself and the next generation makes a lot of our same mistakes.

An ongoing problem for all of us is that we think we understand a particular issue and have it under control. However, the reality is that we are not able to really progress, until we “know what we do not know”.

We have to concentrate on our understanding before changing our management. I remember a lecturer at uni explaining that the saying, “it is all right in theory but not in practice” was illogical. He said that if it does not work in practice then the theory was based on false assumptions, and therefore must be wrong.

I start this book with the basics of what needs to be known, which are really my assumptions, then proceed to combine them all to paint the picture of what a rural producer is trying to achieve in managing a property.

My rural management career started at an early age without the guidance of a father, who unfortunately passed away early in life. One neighbour later confided that he was supplied with plenty of good laughs from some of the things I did. Without the practical guidance of a father, anything was possible and fostered the approach of experimenting, which then became a habit. This book is not about attempting to be different; instead it is about where the journey led from having an open mind, listening to others, and seeking advice.

This story is the culmination of a lifetime on the land observing nature in action. Over the years, my observations were conveyed to scientists for their interpretation, which in turn was the catalyst for further observations. This ongoing close partnership with the scientific community has been responsible for a much deeper understanding of what I have observed. My own experiences were further expanded by what practical producers imparted to me. My journey would not have led to an appreciation of the importance of **carbon** without the contribution of all those who had a genuine interest in understanding how natural systems function. Thus on reflection, this book would be only a few pages if I removed everything that others have helped me with over the years.

I am “blessed” with no formal training in most of the issues/topics raised in this book. As a result, I saw what I saw, not what I was trained to look for.

Knowledge is like building a brick wall, with everybody in the past adding a brick to the wall we started with. This book is an attempt to put one more brick on the wall.

While this book is a discussion on improving our agricultural/grazing systems for the betterment of rural producers as well as society, it goes much deeper. At a more fundamental level, this whole discussion is the need to build **resilience** into the landscape. This applies to **plants** and the **soil** as well as animals. The landscape must be managed so that it can withstand whatever the hard times throw at it, be they wet or dry. Indeed in Australia it is the extremes that determine the norm.

Resilience determines the severity of drought and its long term effect, just as it determines the damage from floods and extreme rainfall events. It also determines the ability of soil to withstand sudden changes in temperature. Bank managers pay less attention to those whose management

ensures the landscape is more resilient. It will become more obvious why I have always believed that, in our sunburnt country, “the only time you can prepare for drought is when it rains”. In fact, most aspects of resilience are consolidated by correct management in the short growing period immediately following rain.

This book will take the reader through the following themes:

- How carbon enters and leaves the landscape;
- The role of carbon;
- Issues currently not associated with carbon that should be; and
- How animals, plants and the soil all interact within the carbon cycle.

With society having a specific expectation of food and fibre production, it is unrealistic to even consider returning to the original functional landscape that existed prior to European settlement. That said, in designing and accommodating different production systems (landscape modification), we have to understand what is required to make them functional, given that plants, animals and everything in the soil will continue to function the same way they always have. Nature has evolved over millions of years and perfected processes that are dependant on other processes, so we have to be careful when considering anything in isolation. It is all about understanding and adaptation, not necessarily change.

In looking at the big picture of the landscape under rural management, this book brings together issues which have previously been treated separately. The problem for rural producers is that they are currently receiving information separately through existing processes, whereas I am trying to pull it all together into one source. The book focuses on showing how all these issues are inter-related. To understand the big picture, it is necessary to appreciate all the issues that carbon influences and what impacts on the movement of carbon. For this reason, we start with carbon processes like photosynthesis, and then slowly thread them through issues like water, nutrients and energy to illustrate interrelationships.

The book is a natural progression of the issues that a rural producer needs to understand. However, the chapter-order is opposite to the generally accepted method of education transfer for farmers. If it was to represent how I actually progressed my thinking, it would be written from the back to the front. My first focus was on animals, then pastures, then soil, and finally carbon. The progression took a lifetime, so I don't want others to waste all the opportunities I did.

In much contemporary literature and media the word “carbon” is prominently associated with climate change. Despite the title, this is not a book about climate change, although it does discuss how our day-to-day management of pastures influences greenhouse gases. In 2000, the science of global warming was not widely accepted by the community, but it is now. This being the case, there is no need to panic, but there is an urgent need to understand how we have to adapt our management, given our changed circumstances.

This book discusses some of the changes “climate change” will bring, in order to appreciate what we have to adapt to. Carbon management has always been important, but with climate change, it is going to be even more important. It is increased carbon stocks that provide the landscape with increased resilience. Fragile landscapes will succumb to the impact climate change brings, while resilient ones have a greater capacity to absorb the different circumstances. This is also true in relation to the impact of drought.

For whatever reason, there has been little recognition in the broader community of the role agriculture can play in contributing to reversing the emissions of the industrial age. The broader debate has been slow to progress past planting trees, which may not always be the best option either environmentally or economically. It would surprise many to know that the soil contains more carbon than all the plants,

trees and the atmosphere combined. Soil carbon can be increased through changed management of agricultural landscapes, whereas the planting of trees to store carbon costs money. In the public domain, attention is drawn to the potent GHG methane (CH₄) produced by the ruminant animals such as sheep and cattle, but not how simple land-management changes can reduce the production of this greenhouse gas.

After all the good times and bad times, my conclusion is that nature is fair but unforgiving. Nature sets out the rules clearly, but we have not enhanced our own wellbeing through disregarding all the carbon and other resources on offer. For those farmers who recognise the importance of carbon in all the forms it takes, the impacts of drought are reduced, business profits are improved, and the natural environment is truly improving for future generations to appreciate and build on.

Enjoy The Journey

