



Carbon Grazing

The Missing Link

Improving plant & landscape resilience

Re-carbonise the soil for profit

De-carbonise the atmosphere

Reduce methane emissions

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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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FOCUSING ON THE BASICS

Success in selling is much like success in sports, says American educator Brian Tracy. Mastering the basics is critical to success. “Unfortunately” he adds, “some 90% of sales staff have not mastered the basics of their work. They’ve not really thought through what they need to know.”

This chapter is all about making sure we understand the basics. This chapter is the foundation on which the remainder of the book is built. Understanding photosynthesis is the first step in the journey of understanding carbon management. After becoming aware of photosynthesis at school, I did not give it much thought for many years. Even when I improved my property management and did things that resulted in increased photosynthesis, it was not due to any awareness of the true importance of this process. There was definitely no understanding of the bigger picture processes that photosynthesis drove. For me, it just simply made sense to allow the plants to grow more so then the animals had more to eat. There was also a general desire to, if possible, not degrade the landscape.

THE ENTRY POINT OF CARBON

Photosynthesis in plants is the entry point of carbon from the atmosphere into the landscape. How does photosynthesis work? During photosynthesis tiny organs inside leaves work like solar panels converting sunlight energy into chemical energy. Plants use that energy to split water molecules into hydrogen ions and oxygen. The oxygen becomes part of what we breathe, about 700 billion tonnes a year. The hydrogen ions combine with carbon for growth.

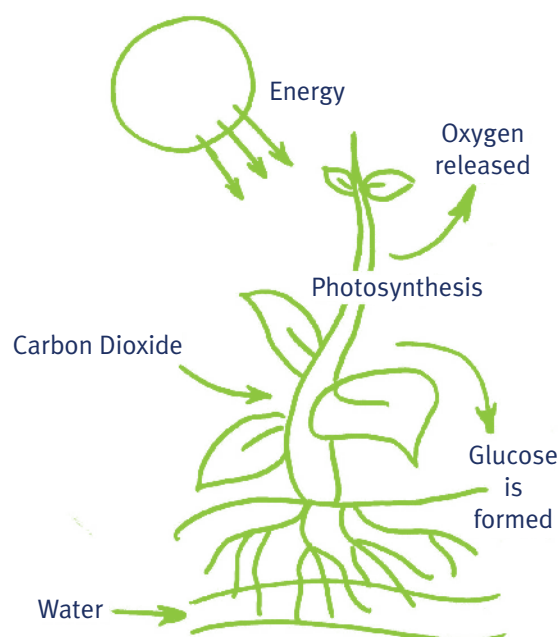
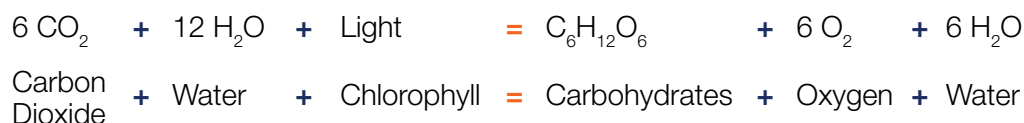


Figure 3: Photosynthesis.

Chemical equation of photosynthesis

To source carbon, plants draw carbon dioxide from the air into their leaves. They extract the carbon from the carbon dioxide molecule and combine it with hydrogen obtained from water to build plant bio-mass. This plant bio-mass is made up of carbon compounds that become the building blocks of all life. Plants are the first form of life that carbon from the atmosphere enters. These carbon compounds are sugars and starches in the form of glucose, cellulose and lignin. They have a higher energy content than the carbon dioxide and water, which are the main inputs, ie they contain higher energy reserves. All other nutrients that plants use come from the soil. Photosynthesis relies on the energy of the sun.

Plants use these carbon compounds to grow leaves and stems above the ground and roots below the ground. Photosynthesis facilitates the movement of carbon compounds into the soil through roots and litter. On productive farms, it is these carbon compounds that “feed” the soil organisms.

As well as producing plant parts to be consumed by life both above and below the ground, plants also release exudates from their roots which feed the important soil microbes. These root exudates are carbon compounds high in energy and are discussed in more detail later.

A plant draws its food from two sources, the air and the soil. It is only plants that use the air as a food source.

The products of photosynthesis, mainly the carbohydrates, account for most of the increased bulk when plants grow and develop. When a plant grows in a pot, the soil does not suddenly drop down, which reinforces that the bulk of the plant comes from the carbon, hydrogen and oxygen in the air and water absorbed. Of course, we know that approximately 50% of plants are carbon when they are dried out.

We often pay little attention to the importance of photosynthesis, but plants are very aware of its importance. Plant a tree on its own and it will be squat and bushy. Plant the same tree in the middle of other trees and it will be tall and spindly. The second tree has to compete with all the other trees for its share of sunlight, ie energy. The two different shapes of the same planted tree type highlight the importance plants place on photosynthesis.

Carbon is a finite resource once it enters the landscape via plants. There is no other way of introducing carbon into the landscape managed by rural producers, but via plants. It needs to be thought of as a commodity by rural producers (ie we need to place a value on it like we do on all other commodities). This commercial valuation of carbon when it enters the landscape should not to be confused with carbon trading. Carbon trading is the placement of value on carbon from an environmental perspective. In carbon trading, carbon has a negative value in the atmosphere and a positive value if sequestered from the atmosphere back to the landscape. Carbon is mobile and a value is placed on it depending on which way it is moving.

Unlike everything else in the landscape, plants go directly to the sun for their energy requirements.

ANIMALS AFFECT PHOTOSYNTHESIS

Plants and animals evolved together. In the process of eating plants, animals can both increase and decrease photosynthesis, and in so doing, change carbon flows. Edible plants, particularly grasses and shrubs which are never eaten by animals, become moribund (rank), and this reduces photosynthesis. Likewise, photosynthesis is reduced when plants are over eaten and there are insufficient leaves left to act as solar cells to catch the energy of the sun and absorb carbon.

The way rural producers manage their livestock, impacts on the plant/soil component of the carbon cycle. If livestock are continually allowed to restrict grass growth, ie photosynthesis, then carbon levels in the soil fall. As stated earlier and to be explained later, soils with low carbon levels produce less grass than soils with higher levels, and it is also of a lower quality. These soils also have less resilience.

WIND AND SUNLIGHT

For some reason, wind is never discussed as a major factor responsible for letting in sunlight. It moves leaves and allows sunlight further into the plant.

CONCLUSION

Producing livestock is all about using plants to turn sunlight (the energy of the sun) and water into a product that is made up of carbon compounds. The efficiency of this process is at the heart of generating profit.



"I HAVE FINALLY GOT TO RE-READING CARBON GRAZING. HOW DIFFERENT IT IS ON THE SECOND READ. I AM CAPTIVATED AS YOU REVEAL THE "SECRETS" OF GOOD GRAZING MANAGEMENT."

...SHANE JOYCE, GRAZIER, THEODORE, QUEENSLAND, AUSTRALIA.

"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."

...DR DAVID FREUDENBERGER, FORMER CSIRO SCIENTIST, CANBERRA, AUSTRALIA.