British Wool fact sheets

Wool & the Carbon Cycle

Since the first oil wells were struck in Pennsylvania in 1870, 115 trillion tonnes of fossilised carbon has been added to the atmosphere from crude oil alone.

While nature can soak up 60% of this additional carbon through photosynthesis and through oceanic storage, the net difference is 4 billion tonnes of additional atmospheric carbon accumulating each year.

All life on earth is based on carbon. Sheep and their wool are part of the natural carbon cycle that underpins all life on our planet.

How the Carbon Cycle works

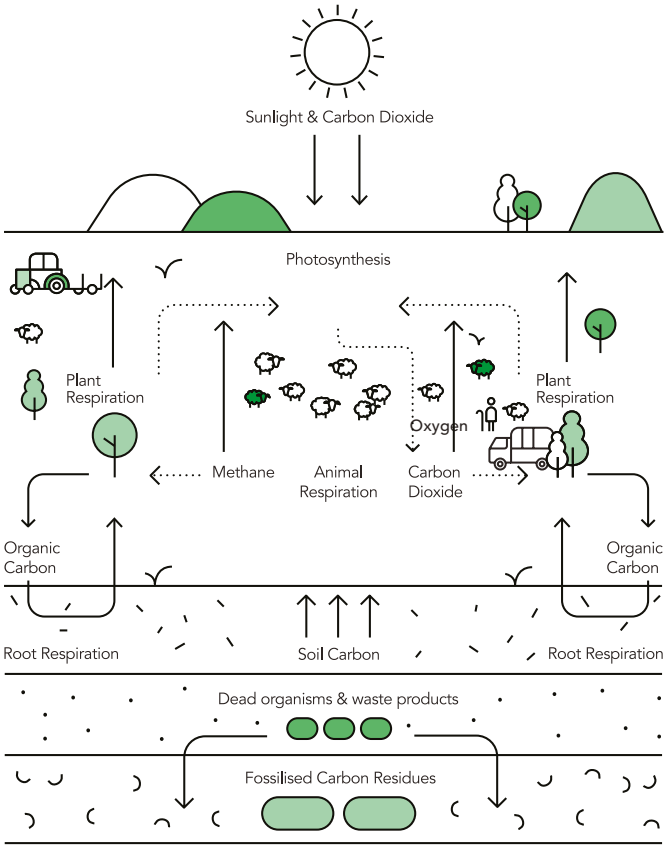
Sheep are part of the natural carbon cycle and this cycle helps to explain how the greenhouse gas emitted from sheep fit within the natural ecosystem.

- The atmosphere, oceans and the land systems are major stores of carbon and the movement of carbon between these stores is called the carbon cycle.
- Carbon exists in the atmosphere mostly as carbon dioxide or CO^2 which can be taken up by plants in the process of photosynthesis and converted to organic carbon.
- Organic carbon is stored in plants and soil. Grazing sheep and other animals consume plants and obtain the energy in organic carbon compounds.
- Most of the organic carbon consumed by sheep is rapidly returned to the atmosphere as CO^2 through respiration, but a small amount (around 6%) is converted to methane gas in the sheep's digestive process.
- In the atmosphere, methane is gradually broken down to CO^2 which is again available to be taken up by plants in photosynthesis thus completing the cycle between the land and the atmosphere.
- While in the atmosphere, carbon dioxide and methane trap heat and are therefore called greenhouse gases with methane being about 28 times as strong a greenhouse gas as carbon dioxide. However, methane breaks down in the atmosphere, whereas carbon dioxide

accumulates[1].

The amount of greenhouse gases in the atmosphere has increased over the past 250 years largely due to burning of the carbon stored in fossil fuels and this has changed the natural balance in the carbon cycle and increased the greenhouse warming responsible for climate change.

Farmers around the world contribute to the natural carbon cycle by influencing the amount of carbon stored in plants and soils and by managing agricultural animals. Good management practices can increase the carbon stored in pastures and agricultural soils and thus make a positive contribution to mitigating climate change[2].



Source: IWTO

Glossary

Atmospheric carbon- in the atmosphere, carbon attached to oxygen in a gas forming CO^2.

Biogenic carbon- carbon that is par of the natural cycle, being derived from living matter has absorbed carbon through its life (such as wool products, sea algae and wool).

Fossil carbon- carbon contained in fossil fuels such as coal, oil and gas, which when released to the atmosphere results in an increase in atmospheric CO^2.

Greenhouse gases (GHG)- primary gases which cause the greenhouse effect are water vapour, carbon dioxide, methane, nitrous oxide and ozone.

Photosynthesis- the process by which plants turn carbon dioxide into living cells. Consuming 6 units each of CO^2 to produce each single cellulose precursor unit, photosynthesis underpins life on earth as we know it and is vital to climate regulation.

References

[1] Chandler, David L.: Explained: Greenhouse gases – Carbon dioxide isn't the only on that matters, and the gases vary widely in potency and duration. MIT News, published January 30, 2017. Accessed on 22.10.2019: http://news.mit.edu/2017/explained-greenhouse-gases-0130

[2] Dignac, MF., Derrien, D., Barré, P. et al. Agron. Sustain. Dev. (2017) 37: 14. https://doi.org/10.1007/s13593-017-0421-2. Increasing soil carbon storage: mechanisms, effects of agricultural practices and proxies. A review. Published in Agronomy of Sustainable Development

[3] Wiedemann et al. 2016; see Allen et al. 2018, Cain et al. 2019