



the local  
carbon  
network

## Urban Farming - Lesson 6 What is Carbon Farming?

**Carbon farming** is a name for a variety of agricultural methods aimed at **sequestering atmospheric carbon** into the **soil** and in crop roots, wood and leaves. Increasing soil's carbon content can aid plant growth, increase **soil organic matter** (improving agricultural yield), improve soil water retention capacity<sup>[1]</sup> and reduce fertilizer use<sup>[2]</sup> (and the accompanying emissions of greenhouse gas **nitrous oxide** (N<sub>2</sub>O)).<sup>[3]</sup> As of 2016, variants of carbon farming reached hundreds of millions of hectares globally, of the nearly 5 billion hectares ( $1.2 \times 10^{10}$  acres) of world farmland.<sup>[4]</sup> Soils can contain up to five per cent carbon by weight, including decomposing plant and animal matter and **biochar**.<sup>[5]</sup>

[source link](#)



**WIKIPEDIA**  
The Free Encyclopedia

## How much time do we have?

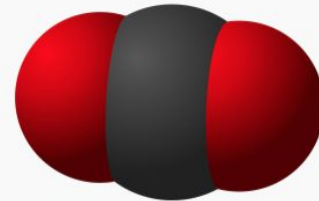
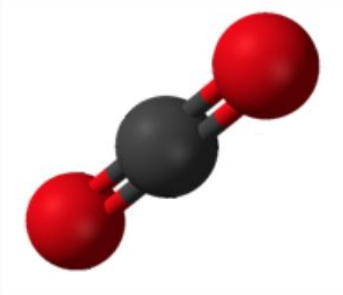
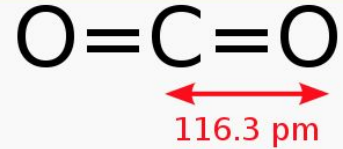
We currently have 12 years left before we reach the CO<sub>2</sub> limit that will keep us under 1.5°C increase. See here what happens if we don't respect the limit with a [2°C increase](#) and with a [5°C increase](#).

<https://climateclock.net/>



## What is CO<sub>2</sub>?

CO<sub>2</sub>, carbon dioxide, is made up of one molecule of carbon and 2 molecules of oxygen. This is important because carbon is a building block of all biological life, it is a good thing, we must just get it to not be in the air, all bound up with the oxygen...



## How do we unlink Carbon from Oxygen?

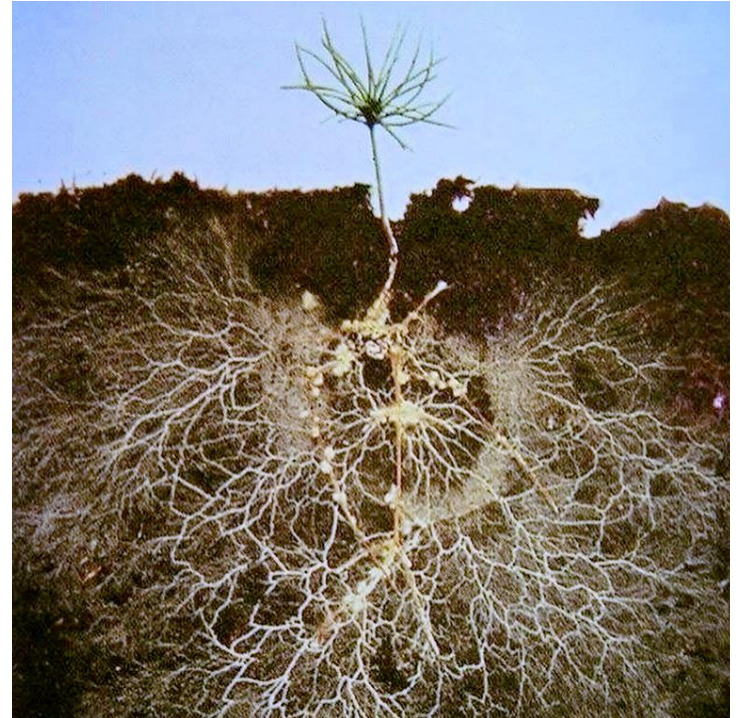
Plants do this work for us as they use use the sun and CO<sub>2</sub> to produce the carbon rich stems and leaves of plants.

They take in CO<sub>2</sub> and emit oxygen. The problem is when that plant burns or decomposes new greenhouse gases are formed.



## It is still a sum positive

Even so, there are many methods we can use to keep the carbon stored in the plants and in the soil. Plants create food for the roots and the roots growing draw into the soil even more carbon. Also we can avoid leaving the ground bare or tilling, and can plant trees with long life spans. Increased soil carbon is also good for soil fertility.



## SOC - Soil Organic Carbon

The world's largest carbon storage is not in the sea nor in the air, it is in the soil. It returns to the atmosphere at different speeds 58% of SOM is SOC.

- Fast pool - 1-2 years
- Medium pool 10-100 years
- Slow pool - 100 -1000 years

Biochar/charcoal (pyrogenic) is slow



## Is there a way to stop plant decomposition?

Indeed there is! We can put it through a charring process (high heat low oxygen) to produce BIOCHAR and in this case half of the carbon originally contained in the wood will be stable in the soil for hundreds of years, while doing plants a world of good.





## How is Biochar beneficial to plants?

### In the compost bin:

It increases the exchange of electrons between microorganisms, increasing the compost temperatures. It stimulates the production of humic acid to have more compost and less emissions.

Reduces methane and NoX emissions by up to 90%

### In the soil:

Stimulates root mycorrhization for better growth. It reduces the amount of water and fertilizers needed. It is a perfect habitat for microorganisms.

## How is Biochar beneficial to plants?

Plants who have been given  
biochar compost are bigger and  
healthier than plants who have  
been given plain compost

These are pictures from Bob  
Flasher at Gilltract Community  
Farm showing AB tests



## How much carbon can we capture?

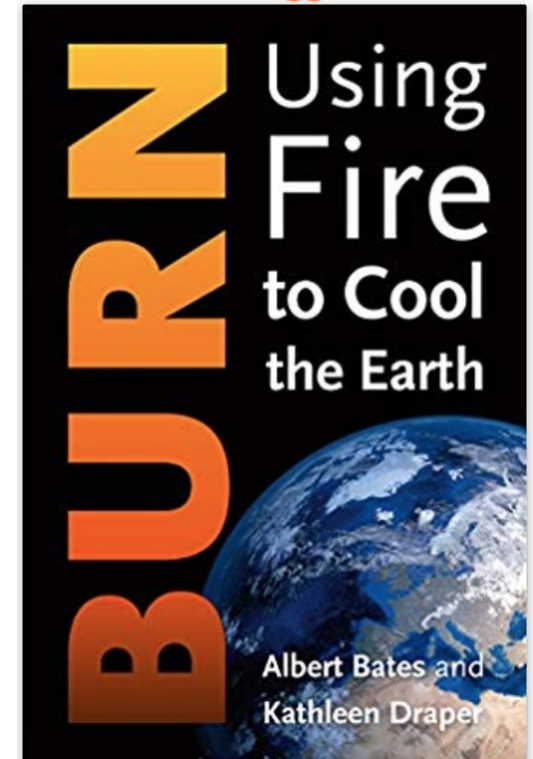
We say that each person on our subscriber program sequesters approximately 1 ton of CO<sub>2</sub> per year. Seeing as much research is still being done, see here [the foundation](#) for our estimate.

That is equivalent to what 50 trees absorb in the same time frame!



## Is that enough to save us?


We emit around 35 Gt CO<sub>2</sub>eq per year. Using biochar in agriculture we are able to sequester about 3 Gt CO<sub>2</sub>eq year (too little). But by also using Biochar in green building we can reach 50Gt CO<sub>2</sub>eq and stop the heating




we are also active promoters of the 12 point program by EPIC Institute that has pinpointed which technologies are currently viable and scalable. If we increase each technology by 10% we achieve carbon balance.

## Source

<http://epicinstitute.org/>



THE EPICENTER FOR CLIMATE SOLUTIONS



**ENERGY DEMAND**

1. Energy Efficiency
2. Heat Pumps
3. Transportation Redesign
4. Electric Vehicles

**ENERGY SUPPLY**

1. Solar PV + Storage
2. Wind
3. Biofuels
4. Solar Thermal

**AFOLU**

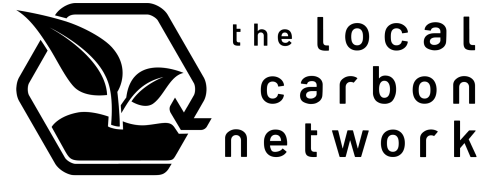
1. Plant Based Diet
2. Sustainable Agriculture
3. Biomass Pyrolysis
4. Afforestation

## And we sell biochar...

We self fund all our free teaching and coaching as well as increase your impact by donating biochar on your behalf to local community gardens, but without our subscribers we are powerless. Please consider visiting our shop page to find our more

<https://localcarbon.net/shop/>





The next lesson explains the soil food web, in other words the living biology in the soil...

If you have any questions please write to us in the Facebook Group

<https://www.facebook.com/groups/LocalCarbonNetwork>

or keep an eye out for our newsletter as we often arrange free online Q&A sessions on ZOOM

or see our FAQ, Articles and videos on the website <https://localcarbon.net/>

Thanks!