

CO₂ Storage in Soil - Can a lot of CO₂ be stored in soil?

Europe's topsoils contain about 75 billion tons of carbon, which corresponds to 275 billion tons of CO₂ worldwide. By comparison, Europe's annual CO₂ emissions, which contribute significantly to climate change, appear low at 4 billion tons of CO₂. But the comparison of such figures also shows the dangers posed by climate-damaging land use and the possible opportunities for climate protection. If only 0.1 % carbon were additionally released from the soil each year, this would correspond to the emission of 100 million passenger cars.

In agricultural soils, the carbon content has often been reduced by 40% or more since ploughing began. For example, heavily degraded soils often only have an organic carbon content of 1.5 %, while well conserved soils can reach 2.5 % and meadows even 3 %. There are estimates, for example, that 90 - 120 million tons of CO₂ per year in Western Europe could be additionally bound in the soil by optimised carbon accumulation if all potentials are exploited. This would correspond to about 3% of Europe's total CO₂ emissions. Increased organic fertilisation, reforestation, set-aside (e.g. for protected areas), climate-effective bioenergy production, organic farming, rewetting of moorland and conservation tillage can contribute to this ambitious goal.

Of course, other harmful greenhouse gases must also be taken into account in the overall balance as CO₂ equivalent = CO₂eq, but this does not lead to contradictions. Using advanced agricultural practice, the FIBL research institute in Switzerland, for example, was able to demonstrate that over a crop rotation period of several years, instead of emitting 4 t CO₂eq per hectare and year, fields with increasing yields are able to store 8 t CO₂eq in addition with bio-organic management and reduced tillage.

CO₂ can of course only be accumulated to a limited extent in the soil, but the available potentials for this can make a considerable contribution to reducing the CO₂ content in the atmosphere, especially in the coming years, which are critical for the climate. Every ton of additional CO₂ stored in the soil delays the exhaustion of the remaining budget

of CO₂ emissions up to 1.5 °C global warming mark (approx. 500 billion tons of CO₂ with 40 billion tons of annual emissions worldwide). Ecologically efficient carbon sequestration also in the soil (CO₂ harvesting) is a decisive building block for Germany and the EU to achieve climate neutrality by 2050, or earlier if possible.

At the same time, increased CO₂ storage in soil only makes sense if it improves climate protection beyond all massive efforts in the industrial and technical sector. The primary goal of agriculture must be to increase the long-term fertility and resilience of the soil, and this goal ideally overlaps with the re-accumulation of carbon in the soil.

Crop.zone will provide important building blocks for securing yields with less and less chemical residues and improving soil and biodiversity in agriculture.

Crop.zone technology allows the avoidance of soil movement for weed control and the expansion of green manure cultivation even without the use of glyphosate. Crop.zone thus creates a decisive prerequisite for well-fed soil organisms, a stable soil structure and the binding of climate-relevant CO₂ as humus in the soil as the basis for sustainable and high-yield crops.