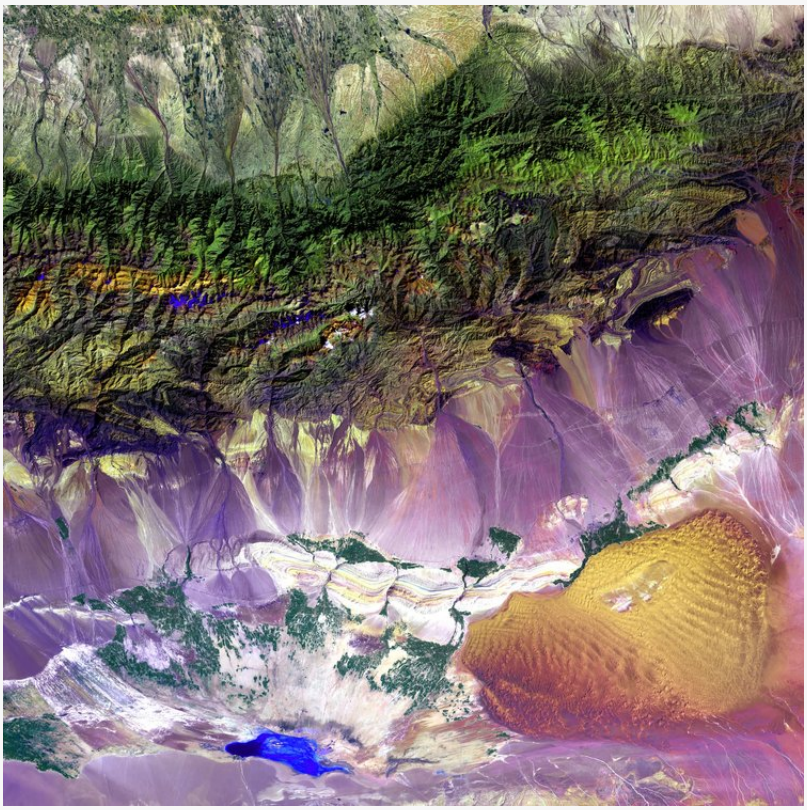
Expanded Carbon Sinks: The First Step to Achieving Climate-Smart Agriculture

Our soil and crops need more carbon and our air already has too much. Regenerative farming will play a vital role in repairing this imbalance.



CONDON, OREGON, UNITED STATES OF AMERICA, August 25, 2022 /EINPresswire.com/ -- We have a problem. There is simply too much carbon on this planet where it shouldn't be. And it's a big problem because carbon is pretty much everywhere. It's a fundamental building block of life and the fifteenth most abundant element on Earth. Every living thing needs carbon to survive and many non-living things like gasses, minerals, and liquids contain it as well.

Specifically, the problem is too much carbon in the atmosphere. Climate scientists have been raising alarm bells for decades that carbon dioxide (CO_2) is a major factor in causing the greenhouse effect, which is when energy from the sun that would normally hit the Earth and reflect back into space is instead trapped in the atmosphere by molecules like CO_2.

There are many gasses that contribute to the greenhouse effect but they all operate on a similar principle. Like the glass panes of a farmer's greenhouse, they let visible light pass through but absorb infrared wavelengths, which raises ambient temperatures. The greenhouse effect is actually an important reason why Earth is so habitable to life as we know it. Without it, the average temperature globally would be below freezing all the time.

But, as is so often the case, too much of a good thing can spoil the party. Human activities, especially the advent of industrialization and the exploitation of carbon-rich fossil fuels, has drastically accelerated the release of terrestrial carbon that was once safely stored in the planet's

land masses, oceans, and organisms into the atmosphere.

A Disturbance in the Carbon Cycle

Carbon circulates on this planet in a circular biochemical process called the carbon cycle. For example, carbon dioxide in the atmosphere is taken in by plants during photosynthesis and when the plant dies and decomposes, the carbon it's stored may sink into the ground soil. If it stays there for millions of years, it can convert into a fossil fuel like coal, and if that coal burns, it will release its carbon back into the atmosphere, completing the cycle.

Before humans threw a monkey wrench into things, most terrestrial carbon that made its way into the atmosphere got there by way of volcanic eruptions. Today, burnt fossil fuels are responsible for sixty times more atmospheric CO2 than volcanoes. Not only is this activity dangerously amplifying the greenhouse effect and contributing to climate change, but it's entirely unsustainable. It takes millions of years for fossil fuels to form, making them a non-renewable energy source. Once we've burned it up, we can't readily make more, and all we'll be left with are new record-high temperatures every year.

Fortunately, the price of renewable energy sources, like solar and wind power, continues to drop and is now competitive with fossil fuels. There is still hope that humanity can cut back on burning fossil fuels aggressively enough to slow the effects of anthropogenic climate change. Stopping the damage is priority one, but even if every major nation cut out fossil fuels cold turkey today, that would still leave literal metric tons of carbon in the atmosphere.

All That Carbon Has to Go Somewhere

What we need are safe places to store carbon where it doesn't negatively interact with solar energy. Such places are called carbon sinks, which are natural or artificial reservoirs that absorb more carbon than they release, trapping it for extended periods. The most abundant natural carbon sinks are vegetation-rich ecosystems like forests, oceans, swamps, and bogs. Soil is also a critical carbon sink, but much of the Earth's agricultural areas suffer from carbon depletion due to intensive, non-regenerative farming practices.

Since the late 1990s and the signing of the Kyoto Protocol (an early UN treaty addressing climate change), there has been growing international awareness of the need to protect natural carbon sinks. Geoengineers have also experimented with artificial solutions like Carbon Capture and Storage (CCS) systems, which, despite recent improvements, are still mostly experimental, non-economical, and not nearly widespread enough to tackle the Earth-sized problem of excess carbon in the atmosphere.

The day may come when technology alone can save us from carbon-based greenhouse gasses, but for the foreseeable future humanity will need to restore and reinforce the natural carbon sinks we already have. And they are more than up to the task. Forests are capable of absorbing 10 to 20 tons of carbon per hectare (100 acres) during their annual growing season, converting gaseous CO2 into solid compounds like starch, cellulose, and the other types of biomass.

Soils must also be a part of the solution because of the sheer volume of carbon it can contain. The Earth's soils contain more carbon than the atmosphere and terrestrial vegetation combined. If left to the natural processes of the carbon cycle, the carbon in soil that is taken up by organisms is gradually replenished by decaying plant matter. Sadly, too-common slash-and-burn agriculture, which tears down forests to farm on the rich soils under them, rapidly depletes the useful carbon in their ecosystem. In some cases, whole forests were destroyed and the farmland that replaced it was used up and abandoned in just two years.

Regenerative Practices to the Rescue
Only improved farming practices can reverse this destructive pattern. Embracing regenerative farming techniques that reduce soil erosion and carbon depletion by limiting overgrazing and excessive exploitation of lands can help keep carbon from escaping into the atmosphere and contributing to climate change. Most of these techniques are not new to the organic farming community, such as no-till and low-till farming, residue mulching, cover cropping, and crop rotation.

According to the Rodale Institute, one of the oldest and most respected nonprofit organizations devoted to researching organic farming, agricultural carbon sequestration is one of our best opportunities to stop runaway greenhouse gas emissions.

By better managing our soils, carbon molecules that might otherwise find their way into the atmosphere can instead become a valuable asset that helps farmers improve the yields and profitability of their lands. Read More

Fred Parent
GÜDPHORIA
+1 866-335-5946
email us here
Visit us on social media:
Facebook
Twitter
LinkedIn
Other