What is regenerative farming, and is it a solution to climate change?

At a high level, Regenerative Agriculture is a system of farming practices based on decades of science and applied research that when combined, helps to enrich soils, increases biodiversity, improves watersheds, and ultimately harnesses carbon in the soil.

The premise of Regenerative Ag is to replicate nature instead of conquering it. It promises to increase yields, enhance the health and vitality of farms for generations to come, as well as provide resilience to climate instability. But not all farms apply these principles the same way. Because there is no stringent set of guidelines for what is considered “regenerative farming,” each operation will vary the application of these practices, as well as how they measure the success of their regenerative efforts.

Soil can save our planet? And reverse climate change? Regenerative ag is also a tool to reduce CO2. Even though agriculture, forestry, and land use account for approximately 18% of annual greenhouse gas emissions, these claims about soil are only partially true. Farming practices and soil health are just a piece of the puzzle to carbon emission reduction.

Credit: The Rail

The Trailblazer: Gabe Brown

The face of the regenerative ag movement is North Dakota farmer Gabe Brown. After nearly losing his 1,760-acre family farm outside Bismark due to a series of massive hailstorms, blizzards, and successive crop failures, Brown turned it all around. Having been introduced to the central ideas of regenerative farming over the years, it was not until he aggregated his learnings and applied them simultaneously to his farmland that he was able to boost microbial activity in the soil, retain carbon, and restore ecological balance.

As Brown explains, regenerative ag is a real paradox: the best way to achieve it is to do less, not more.

Gabe Brown used synthetic fertilizers like many other farmers in his area but decided to try something a little different when he removed them altogether. Brown then experimented with planting several one-acre plots with varying monoculture cover crops and then on one plot, he planted everything together in what he called a “biodiverse polyculture cocktail.” What he witnessed over two very dry and challenging months was that productivity was three times greater on the polyculture cocktail plot.

Since Gabe’s polyculture plot also realized higher yields than his neighbors, he was determined to find out how this was possible. His water filtration rates also skyrocketed, going from a one-half inch of water filtered per hour to one inch in only nine seconds. To further measure his success, he conducted carbon-retention testing using soil samples.

Given these dramatic results, Gabe no longer applies synthetic fertilizer. He practices rotationally grazing his livestock on these plots, leading to increased soil health and yield. Many farmers find they reduce synthetic fertilizers with this method, but few have gotten to the point of eliminating them altogether without negative yield effects.

Compared to the typical 10 to 30 tons of carbon stored in conventionally-farmed soils of the Northern Plains, Gabe has found “where we’ve done in-depth, significant testing, our soils have 96 tons of carbon per acre in the top 48 inches”. Many agree that measuring carbon sequestration is the best hope for demonstrating the power of regenerative agriculture, though not all operations will have the ability to use this measurement technology.

What makes something “regenerative”?

At the core, regenerative agriculture is the practice of farms finding various ways to draw substantial carbon dioxide from the atmosphere. But it is much more than that: it enriches the soil by diversifying its microbiome, preventing erosion, and increasing its water. Regenerative ag can be done with a variety of methods, including no-till farming, crop rotation, and animal grazing, just to name a few. But all methods must adhere to these four key principles:

(1) improving soil, water, and biodiversity

(2) creating unique combinations of these farming practices to suit each operation

(3) ensuring these practices work for the landowner, farmer, producer, and all other stakeholders

(4) continually grow and evolve practices to reach maximum potential

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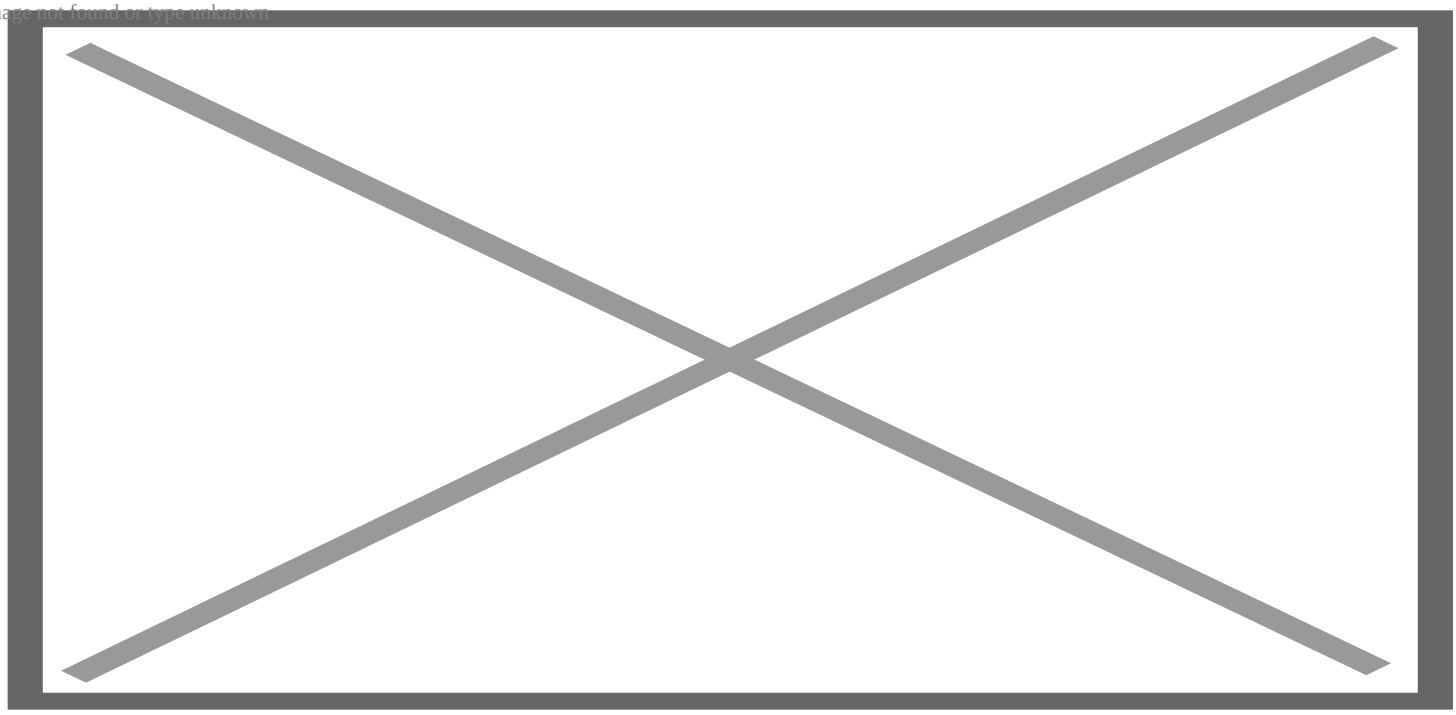

How is the success of regenerative agriculture measured?

One of the more contentious debates within regenerative ag is how farmers measure the successes of their operations. However, efforts are in the works to make quantifying regenerative ag an affordable, relatively pain-free process.

Currently, the majority of farmers calculate their reductions of inputs and increased crop yieldsto determine the effectiveness of their particular regenerative ag practice. This includes decreased pesticide use which ultimately reduces overhead costs, increases yield, retains water in the soil, and enhances resilience to pests and drought.

Subsequent investigations

Dirt to Dinner seeks to answer these questions in subsequent Regenerative Ag posts:

- How does carbon make the soil healthier, and by how much? Who benefits – the farmer? The consumer? The environment?
- What is in it for the farmer? And will the government mandate specific practices? A deeper dive into carbon credits versus incentives.
- What does the ramp-up to becoming regenerative look like? How long does it take soil to be regeneratively productive?
- What is the payback for farmers to compensate for the ramp-up period? Does the yield increase in all cases? Or is it location specific?
- What are the stories of other farmers successfully practicing Regenerative Ag?

The bottom line

While regenerative agriculture may not have a universal definition, the end goal is to renew our soil through a variety of beneficial agricultural practices and principles. While this is not a cure-all for climate change, it certainly is a step in the right direction for enhancing soil health.

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