

If Modern Agriculture Were a Person, It Would Be a Sociopath: Can Regenerative Farming Save Us From Ourselves?

By Wayne Visser

Regenerative agriculture is a systemic solution in that it multi-solves across our nature, climate and health systems

Naming the problem: A sociopathic agricultural system

There is a great paradox in modern agriculture. The agro-industrial sector is feeding people while harming society and starving the planet. In 1962 one farmer fed 25.8 persons; today it is 155.[1] But according the UN, global agrifood systems incur roughly \$12 trillion annually in hidden social and environmental costs.[2] The Rockefeller Foundation found that in the U.S. alone, the true costs of the food system are \$3.2 trillion per year, which is three times what Americans actually pay for their food.[3]

This agricultural sociopathy—or ecopathy, as some have started to call it, since many of the biggest impacts are on nature—is the end result of nearly two centuries of optimising agriculture for efficiency, using a combination of mechanised labour, seed engineering, and chemical fertilizers. In the process, we have created a food system that delivers high production, but at the cost of the environment.

Let's hone in on one part of the system: chemical fertilizers. In my Norfolk village in England, along the river, there's an old bone mill, which used to crush bones (including from humans) for agricultural fertilizer. The plant-growth benefits of bonemeal and nitrogen were discovered by German chemist Justus von Liebig. In 1841 British industrialist John Bennet Lawes turned this knowledge into the world's first artificial fertilizer factory at Rothamsted. 70 years later BASF began commercial production of synthetic nitrogen fertilizer, and the modern agricultural system was born.

What, you might ask, is sociopathic about chemical fertilizers that help food to grow and have arguably averted mass starvation? The answer is three-fold. First, chemical fertilizers are turning living soil into lifeless dirt by starving and dehydrating microbes and organisms and acidifying the ground. Besides the ecological impacts of dying soils, plant breeding for higher yields has also come with health costs. In the UK, trace mineral content in UK fruits and vegetables fell 50-80% between 1940 and 1991,[4] and in the US, nutrients across 43 garden crops fell 6-38% between 1950 and 1999.[5]

The second problem with chemical fertilizers is that they support the dominance of single plant species (through mono-cropping), which leave no ecological space for wildflowers and other plants to flourish, which in turn impacts insects, birds and mammals. This helps to explain why over 40% of all insect species are in decline and a third are threatened with extinction,[6] and also why we have lost 73% of wildlife populations since 1970, according the WWF's Living Planet Report.[7]

Perversely, we have known about the biodiversity impacts of synthetic agriculture right from the start. In 1856, Liebig conducted his famous Park Grass Experiment at Rothamsted Experimental Station in England, in which he tested organic and chemical fertilizers on 24 strips of land and found that fields treated with chemical fertilizers retained 2 or 3 wild plant species, while untreated fields supported 50 species.[8]

The third unintended consequence of artificial fertilizers is that they end up overloading our water systems, leading to algae blooms (eutrophication) that decrease oxygen in the rivers and oceans (hypoxia), resulting in aquatic dead zones. This disruption of global nitrogen and phosphorous cycles is why Biochemical Flows is one of the nine Planetary Boundaries that has been breached and sits in the high-risk zone, according to the scientific work of the Stockholm Resilience Centre led by Johan Rockström and Will Steffen.[9]

Testing a solution: Organic regenerative farming

So much for the problems. What about solutions? It took a while for a countermovement to find its feet, with the first organic food labels emerging in Germany in 1928 (Demeter biodynamic agriculture certification), the UK in 1967 (Soil Association certification) and the US in 1973 (California Certified Organic Farmers certification). Today, 98.9 million hectares of agricultural land are managed organically, still a mere 2.1% of all land under cultivation, albeit higher in regions like Australia (13%) and (Europe (11%)).[10]

The latest evolution of this movement is regenerative agriculture, which goes beyond banning or reducing chemicals and is focused on restoring the living health of the soils. It is a technology in sense that economist John Kenneth Galbraith understood the term, namely “the systematic application of scientific or other organized knowledge to practical tasks.”[11]

Regenerative agriculture includes various techniques such as planting perennial crops and cover crops, using organic compost as natural fertilizer, increasing crop diversity and crop rotation, introducing animals on the land in ways that mimic nature, practicing minimum tilling, and turning agricultural waste into biochar that is reintroduced into the soil.

Many of these practices are not new. When my grandparents were farming in Africa, crop and livestock rotation was standard practice. Now the science is backing up this time-tested wisdom. An experiment in Iowa testing multi-year crop rotations (combining corn, soybean, oats, and alfalfa) demonstrated that substituting manure for most artificial fertilizers reduced fossil energy use by 64% and carbon emissions by 42%. Remarkably, these longer rotations maintained or increased corn and soybean yields while significantly improving overall profitability.[12]

This shows that regenerative agriculture is a systemic solution in that it multi-solves across our nature, climate and health systems. Years ago, I interviewed James Lovelock, the originator of the Gaia theory, which hypothesizes that the earth behaves like a living organism. When I asked him about the climate crisis, he said that the only way to reach

the required scale of carbon sequestration is to work with nature. His proposed solution was biochar, one of the regenerative farming practices.

Today, international climate scientists (represented by the IPCC) estimate that regenerating our soils could reliably offset 10% to 15% of total global emissions (4 to 5 gigatonnes of CO₂ per year),^[13] with more bullish studies suggesting that soil could lock away 15 billion tons of carbon annually, thereby reducing atmospheric carbon to preindustrial levels within 20 years.^[14] Regenerative agriculture is no panacea, but it may contain the seeds of our own salvation.

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This article is adapted and updated from content in Wayne Visser's book *"Thriving: The Breakthrough Movement to Regenerate Nature, Society, and the Economy"* (New York: Fast Company Press). For more information, see waynevisser.com.

Citations

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