

The Time Is Now

Today's weather is the catalyst for drafting this essay. It's December 15, 2021, the hottest December day on record in south central Wisconsin. December's average high temperature in Madison, our state's capitol, is 30 degrees Fahrenheit¹; today's high, 68 degrees²; now it's evening, scary; there's a tornado watch and a high wind warning. It's not a week since unprecedented, devastating tornadoes tore through Kentucky and nearby states.

Fifteen years ago, not long after Hurricane Katrina caused unprecedented destruction, Bill McKibben published "Welcome to the Climate Crisis," in the Washington Post.³ He wrote that there's no technological silver bullet, "only silver buckshot" and went on to advise that we prioritize low-hanging fruit "beginning with reducing the massive energy waste in our system."

The reduction of massive energy waste Mr. McKibben was speaking of is the fundamental conundrum of how we humans produce energy for heating, transportation and other purposes. Taking a step further upstream, virtually all life on earth exists by grace of the free solar energy our planet is continuously receiving.

In the Upper Midwest, because of an array of government subsidies and incentives and the way that markets have evolved under the policies that have enacted them, production of corn and soy is the primary use of agricultural land. Notwithstanding, scaled up ecological planting of cereal rye (*Secale cereale*), for harvest and as cover crop, is, simply put, an incredibly low-hanging fruit for us to move toward efficient use of solar energy, both direct and harnessed, i.e., manmade. Cereal rye is the most cold-hardy grain, meaning that in the Upper Midwest it is uniquely capable of being planted and germinating after the corn or soy harvest—utilizing solar energy that would otherwise go untapped. Rye's energy efficiency continues synergistically through the winter as the plants' abundant living roots reduce soil erosion, scavenge nitrogen and are the earliest in spring to access freely available, otherwise unutilized solar energy.

Living plants rooted in the soil through the winter are an effective way to regenerate and restore precious microbial life, minerals and other critically important compounds that contribute to the vitality of plants or foraging animals. The alternative, fields without a winter (cover) crop, are a leading factor in calamitous soil erosion and topsoil runoff, with their attendant degradation of waterways near and far.

When rye is grown as a cover crop and returned to the soil, the plant's nitrogen-scavenging ability reduces the need for and cost (monetary and ecological) of application of nitrogenous fertilizer for the subsequent planting. Manmade fertilizer is produced by a notoriously energy-intensive process that feeds the climate crisis. Astute organic/regenerative farmers and

¹ <https://www.usclimatedata.com/climate/madison/wisconsin/united-states/uswi0411>

² <https://www.channel3000.com/madison-breaks-record-for-warmest-december-day-ever-recorded/>

³ https://www.washingtonpost.com/wp-dyn/content/article/2006/05/26/AR2006052601549.html?utm_term=.bebdc2b3bd56

ecologists (including several of the co-authors of this statement) are eager to share their knowledge of how to seed clover, part of the legume family, into dormant rye. Legumes are unique in that their root systems synergize with soil bacteria to naturally generate (“fix”) plant-accessible nitrogen from air’s vast reservoir of inaccessible N₂. (Air is 78% N₂!)

Rye possesses additional noteworthy climate-friendly attributes. The grain has been dubbed “the unruly weed” for such attributes as its resistance to winterkill and its competitive advantage when an inter-cropped field subsequently self-seeds.⁴ Also, rye is one of a relatively small group of plants that are innately allelopathic, i.e., have a root system that suppresses growth of competitors, reducing the need for alternative means to control weeds (i.e., herbicides). To farmers and others concerned with ecosystem well-being rye’s suite of attributes indicates the plant’s potential as an obvious gateway for grain growers considering transitioning to organic production.

In 2017 Paul Hawken published *Drawdown*⁵ as the culmination of his longstanding and multi-dimensional efforts to galvanize world attention to our existential climate crisis. The volume lays out an array of 100 presently implementable solutions to the crisis and of the 20 top solutions eight relate to the food system.⁶ We observe that planting more rye in the Upper Midwest strengthens four of those eight. The *Drawdown Review*,⁷ a 2020 update uses a slightly different calculus to organize solutions to the climate crisis. Within its Food, Agriculture and Land Use sector, a dedicated effort to increase rye-in-the-ground definitely strengthens three of Project Drawdown’s seven solutions that favorably “shift agricultural practices” — conservation agriculture, regenerative annual cropping and nutrient management” and is tangentially valuable for a 4th solution, “farm irrigation efficiency” (p.29).

Soil health exists on a multi-dimensional continuum; a complex set of factors undergird the attributes of healthy soils. Refining understanding of how to best achieve and sustain maximal soil health is a hot topic these days; likewise finding language to best articulate the evolving understanding. The same year that *Drawdown* was published (2017), California State University at Chico’s Regenerative Agriculture Initiative and The Carbon Underground offered a conceptual description of regenerative agriculture accompanied by more detailed explication of regenerative agricultural practices. The description begins: “farming and grazing practices that, among other benefits, reverse climate change by rebuilding soil organic matter and restoring degraded soil biodiversity – resulting in both carbon drawdown and improving the water cycle.” It concludes with a post-script: “This definition will continue to evolve as research and practice inform what builds the health of soils, sequesters carbon, and grows more topsoil for future generations.”⁸ The “definition” has been embraced and is being promoted by other leading entities working in the field such as Regeneration International, a preeminent worldwide

⁴ Ginsberg S, *The Rye Baker Classic Breads from Europe to America* Norton & Co Inc, 2016, (pp.14ff).

⁵ Hawken, Paul, ed. Penguin, 2017.

⁶ https://www.ted.com/talks/chad_frischmann_100_solutions_to_reverse_global_warming#t-1013940

⁷ <https://www.drawdown.org/sites/default/files/pdfs/TheDrawdownReview-2020-Download.pdf>

⁸ https://www.csuchico.edu/regenerativeagriculture/_assets/documents/ra101-reg-ag-definition.pdf

regenerative agriculture research and advocacy network.⁹ To our understanding, rye’s attributes establish the plant as a critically valuable part of climate-smart Upper Midwest agroecology that fully aligns with the definition of regenerative agriculture.

We feel equally strongly that recognition of rye’s potential to favorably impact the agroecological contributors to the climate crisis and other intertwined major societal challenges supports the groundbreaking, better, ground-nurturing, concept Rights-of-Soil (RoS) that Dr Rattan Lal, recipient of the 2020 World Food Prize introduced in 2019. As Dr. Lal writes, RoS implies “soil is a living entity; sustains life; and has a right to thrive, flourish, and be protected. Thus, the RoS is not based on economic benefits, but on protecting and restoring the soil for the greater good of the planet rather than just for the humanity. . .”¹⁰

This is not the space to even cursorily present information about rye’s value to American and immigrant cultural history, its particular distinct nutritional strengths for people, and, as both feed and forage, for diverse species of farm animals, for the nascent renaissance of rye for baking artisanal bread and pastries, or even its importance as America’s original whiskey.

We did cursorily introduce another key aspect of America’s rye story at the beginning of the essay: The existence of an array of government policies that overwhelmingly favor corn and soy production on Upper Midwestern agricultural land. This labyrinth is nothing less than the proverbial elephant in the room. For now we merely acknowledge the obvious: Getting more rye plants in the ground is one of many climate-smart agricultural strategies being undermined by the rigged agricultural playing field. Some others that are disincentivized include the promotion of perennial agriculture and (not wholly distinct) the scaling up of local food production to match local need.

In sum, we believe that well-managed rotations that include rye could, should, and would positively impact Upper Midwestern farms’ appropriately calculated multi-year balance sheet.¹¹ The advanced and advancing degradation of the Upper Midwest’s ecosystem, widely acknowledged in the published literature¹² is also unpleasantly knocking on our doors and slamming, increasingly vocally, into our windows. Millions of acres of rye plantings annually is a necessary, immediate and critical component of a well-considered, multi-pronged response to the climate crisis.

Signed: Rita Hindin, Avery Robinson, Sandy Syburg, Gary Zimmer: Members of the **Rye Revival** core team. (ryerevival.org; <https://www.facebook.com/ryerevival.org>)

⁹ <https://regenerationinternational.org/2017/02/24/what-is-regenerative-agriculture/>

¹⁰ Lal, R. J Soil and Water Conservation 7-8/ 2019— doi:10.2489/jswc.74.4.81A

¹¹ Could –absent subsidization and incentivization of other crops; should--we think rapidly transitioning to a level agricultural playing field is right.

¹² See, for example, Prokopy L et al. [Agric Human Values](#) May, 2020 v23 “The Urgency of Transforming the Midwestern U.S. Landscape into More than Corn and Soybean.” (total of 28 co-authors at 12 Midwestern universities, ag and environmental organizations) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7245187>