



Relationships of regeneration in Great Plains commodity agriculture

Julie Snorek¹ · Susanne Freidberg¹ · Geneva Smith¹

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Abstract

In recent years regenerative agriculture has attracted growing attention as a means to improve soil health and farmer livelihoods while slowing climate change. With this attention has come increased policy support as well as the launch of private sector programs that promote regenerative agriculture as a form of carbon farming. In the United States many of these programs recruit primarily in regions where large-scale commodity production prevails, such as the Great Plains. There, a decades-old regenerative agriculture movement is growing rapidly, but not due to the incentives offered by companies' carbon programs. On the contrary, farmers are adopting regenerative practices to cut their dependence on corporate agrochemical inputs and expertise, and to thereby achieve technology sovereignty. These practice changes often strain farmers' existing social relationships while drawing them into new and previously neglected ones, including the more-than-human relations necessary for building soil health. These new relationships and the knowledge they generate may in turn lead farmers to think differently about their own autonomy. These findings provide insight into farmers' skepticism of private sector carbon farming programs, and highlight the value of attention to the multiple types of relationship change that accompany and facilitate regenerative transitions.

Keywords Regenerative agriculture · Carbon markets · Soil health · Autonomy · More-than-human · Technology sovereignty · Great Plains

Introduction

The fifth generation Kansas farmer sat in his home office listing off the tillage equipment he had sold a few years before. “A disc, a field conditioner, a couple of chisels, packers - just sent ‘em down the road.” The decision was a “huge struggle,” he recalled, but “now we’re in it. And we’re not going back.” It referred to his path toward regenerative agriculture, an approach to farming he hoped would improve his soil, his bottom line, and his overall quality of life.

The farmer went on to describe his experiences with the regenerative practices he’d adopted so far – reduced tillage, cover cropping – and with the many companies who had offered to pay him for the carbon that those practices would supposedly sequester in the soil. He had not yet signed up for any of these carbon programs. The potential earnings

appealed, but not if they came with the same sort of risks and obligations that he was hoping to escape, or at least lessen, by transitioning to regenerative agriculture (RA).

The past few years have seen unparalleled interest in RA’s potential to restore degraded farmlands, sustain yields, and improve farmer livelihoods – all while slowing climate change. As a set of principles and practices centered on soil and ecosystem health, RA is hardly new. But only relatively recently has it attracted attention as a potential climate solution. With this attention has come increased policy support as well as a growing number of private sector carbon programs, run by corporate food manufacturers, agribusinesses, and ag-tech startups. Whether they focus on generating carbon offsets or insets (Plastina 2022), most U.S.-based carbon programs are recruiting primarily amongst the commodity row crop producers (especially those in the Midwest, Northern and Southern Plains and parts of the Southeast) who are most likely to have the acreage, agronomic conditions and technology needed to sequester and account for carbon on a large scale.¹

✉ Susanne Freidberg
susanne.e.freidberg@dartmouth.edu

¹ Department of Geography, Dartmouth College, Hanover, NH 03755, USA

¹ Food manufacturers running such programs (such as General Mills and PepsiCo) typically pay farmers for the practices they adopt and

These programs have attracted criticism from environmentalists who doubt their motives, and from scientists who question their carbon sequestration claims (Cadloff, 2021; Casey & Lucas, 2023; Fawcett-Atkinson, 2021; Fox, 2023; Popkin 2023). But they have not attracted many farmers. Surveys of row crop producers find that while more than nine out of ten know about carbon programs, only one to three% have enrolled in them (Mintert and Langemeier 2023; Urban and Cole 2022). Survey research has also identified several reasons for such low participation rates, ranging from inadequate payments to burdensome paperwork to the perception that the programs' methods for calculating carbon credits amount to "smoke and mirrors" (see also Creswell, 2022; Han and Niles 2023; Palen, 2022; Urban and Cole 2022; USDA 2023a). Studies of farmers' reasons for adopting carbon-sequestering practices, meanwhile, find that carbon payments are rarely a major driver (Buck and Palumbo-Compton 2022).

These findings raise doubts about the prospects of private sector carbon programs to drive the adoption of RA on the scale needed to fulfill its perceived promise as a climate solution. They also raise questions about the aims and experiences of farmers who *have* transitioned to RA - or at least started that process - in regions where the norms and institutions of industrial agriculture remain well-entrenched. Our research in the Great Plains (primarily Kansas and Nebraska) began with these questions. Unlike Tittone et al.'s characterization of corporate RA as "approaches followed by large enterprises" (2022, p.8), we did not assume that large-scale farmers see their interests in RA aligned with those of large companies. Nor did our findings support that assumption. Instead, we found that farmers often turn to RA to reduce their dependence on corporations for inputs, expertise, and (to some extent) markets. In other words, they aspire towards a form of *technology sovereignty* (Altieri and Toledo 2011; Montenegro de Wit 2022) that they associate with greater individual autonomy as well as better returns on the time and capital they invest in their farm enterprises. In addition, we found that as the practice of RA draws farmers both away from certain relationships and into new and previously neglected ones - with each other as well as with the non-humans that help build soil health - it may also change how they understand, value and pursue autonomy. These findings offer insight into farmers' ambivalence towards programs that pitch RA as carbon farming. More broadly, they highlight the value of attention to the multiple

types of relationship change that accompany and facilitate regenerative transitions.

Farmer autonomy, technology, relationality

The relationship between agricultural technology and farmer autonomy surely counts among the more enduring concerns in agrarian studies. Whether mechanical, biological, chemical, genetic or digital, farmers and scholars have long recognized how technologies that free farmers from age-old constraints and burdens can at the same time impose new dependencies and vulnerabilities (Berardi and Geisler 2019; Ramey 2010; Wade 1974). They have also appreciated how the balance of those tradeoffs depends on not only the farmers' capabilities and socioeconomic status (Pearse 2015) but also the locus of control over a technology's development, dissemination and use. Decades ago, concerns about smallholder dependency on imported machinery and external inputs fueled critiques of the Green Revolution (Shiva 1991; Wade 1974). Minimizing such dependency has since become one of the primary objectives of agroecology as both a science and a movement seeking multiple sovereignties (Rosset and Martinez-Torres 2012; Wezel et al. 2009). As Altieri and Toledo (2011) see it, agroecological farmers' reliance on "the environmental services derived from bio-diverse agroecosystems and...locally available resources," allows for technology sovereignty, which they define simply as the ability to "produce without external inputs."

Montenegro de Wit (2022) takes up Altieri and Toledo's conception of technology sovereignty in her recent critique of the narratives optimistic about the potential of biotechnology (and especially gene editing, or CRISPR) to advance rather than threaten agroecology (Lotz et al. 2020). As a product of worldviews and power structures historically at odds with agroecology, she argues, CRISPR can only complement the latter if it too "works with nature," builds and draws on local knowledge and skills, and improves local control over not just food but also the tools, resources, and innovation processes needed to produce it (Montenegro de Wit 2022, p.748). Montenegro de Wit thus defines technology sovereignty more broadly than do Altieri and Toledo and situates it more locally. But not all localities favor this ideal (Born and Purcell 2006). In our Great Plains research we found that farmers who adopted RA practices commonly experienced local disapproval, leading them to forge networks with other regenerative farmers further afield. For them, working with nature and building their RA knowledge and skills has required breaking away from local norms.

Montenegro de Wit stresses however that her framework is not definitive but rather a "starting point for further dialogue and elaboration." Our research speaks to the dialogue

then count the sequestered carbon towards their corporate emission reduction targets (known as "insetting"). The agribusinesses and start-ups running carbon markets (such as Bayer, Indigo, and Corteva) pay for the carbon sequestered (and sometimes also for practices). In this paper we refer to all of them as "carbon programs."

already underway between scholarship on *sovereignty* as a collective goal and scholarship on *autonomy* as a farm or household level condition - albeit one that may both inspire and strengthen collective movements (Anderson et al. 2019; Stock et al. 2014; Stock and Forney 2014). Altieri and Toledo's definition of technology sovereignty in fact closely resembles van der Ploeg's influential conception of farmer autonomy as the "creation and maintenance of a self-controlled resource base [which]...allows for a degree of freedom from economic exchange; it is built, at least partly, *on an exchange with nature*" [emphasis in original] (van der Ploeg 2009, p. 25). For van der Ploeg, the struggle to maintain or reclaim autonomy is a defining feature of "peasantness" and a driving force of the "repeasantization" he and other scholars see occurring around the world (Calvário 2017; Nelson and Stock 2018; see also Strube 2022). This term describes a wide range of processes, from formerly landless groups taking up subsistence production to Kansas commodity farmers' experiments with conservation tillage (Nelson and Stock 2018). In all cases, work with the "self-controlled resource base" (meaning both labor and nature) allows for greater distance from industrial food and/or input markets.

Jansen et al.'s (2022) critique of van der Ploeg's repeasantization thesis raises two points germane to our own study. First, they note that farmers of all sizes may see *greater* market participation as both an exercise of autonomy and a way to enhance it (See for instance Castellanos-Navarrete and Jansen 2018). After all, if such participation increases their income and/or access to labor-saving technology, it could give them more freedom to work how and when they want, and perhaps work less overall (Stock and Forney 2014). But for Stock et al. (2014), farmers who see freedom as an ideal achieved through the market are enacting *neo-liberal* not *actual* autonomy (see also Emery 2015). Drawing on Marx's notion of real freedom, the latter describes farming livelihoods that assure farmers' collective social reproduction and that provide fulfillment rather than just income. Stock et al. (2014) see examples in Swiss and Brazilian marketing cooperatives that have shifted partly away from low-value commodity markets (i.e. liquid milk) and associated "expert systems" toward value-added products (*terroir* cheese), shorter supply chains, fair farmgate prices, and a greater reliance on farmer knowledge and "tinkering" - that is, adapting tools to the immediate social and material context (Mol et al. 2010; Stock et al. 2014, p. 420). They emphasize that cooperation does not by itself assure an individual farmer's actual autonomy, and that what matters at least as much is the critical perspective on markets that cooperative membership might engender (Ibid, 414).

In a related example, Carolan compares Right to Repair and Farm Hack, two groups challenging corporate control

over "smart" farming equipment and the data it generates. Although the first group uses the language of rights, similar to sovereignty movements, its farmer members are mainly concerned about their own private property rights, and specifically the right to repair machines that enhance their own productivity and competitiveness (Carolan 2018). By contrast, Farm Hack describes itself as "a worldwide community of farmers that build and modify our own tools. We share our hacks online...because we become better farmers when we work together" (<https://farmhack.org/tools>).

As scholarship on the "good farmer" identity demonstrates (Burton et al. 2020), farmers' ideas about what it means to become *better* farmers vary, as do their ideas about the value of working together toward that end (Cofré-Bravo et al. 2019; Sutherland and Burton 2011). This scholarship also shows that farmers who have traditionally equated good farming with maximal productivity may come to value greener practices if presented with new economic incentives and/or technologies (Burton et al. 2020; Lavoie and Ward-ropper 2021; McGuire et al. 2013; Roesch-McNally et al. 2018) - including technologies that connect them to broader publics (Riley and Robertson 2022). That said, change does not necessarily come quickly or uniformly (Saunders 2016). The Kansas organic farmers interviewed by Nelson and Stock (2018) in the early 2010s, for instance, enjoyed a "peasant-like" autonomy thanks in part to a loyal local customer base (94). But in a region where the entire agricultural infrastructure (input supply, extension, marketing, processing) favored commodity crop and livestock production, their livelihoods were so far from prevailing norms that, as one interviewed couple said, "some people say we're not farmers" (98).

Several years later, our research in Kansas and Nebraska found that the infrastructure to support the adoption of regenerative or otherwise alternative practices has in some ways improved. But farmers considering such practices may still have to contend with uncooperative landlords and disapproving neighbors (Ranjan et al. 2019). Regional land markets and ideals of "rugged individualism" can make it difficult for farmers *not* to treat their work as a competition for more bushels and bigger equipment (Gahman 2020; Laforge and McLachlan 2018a). Yet our research also found that experience with RA gave farmers different perspectives on both their work and who they were doing it *with*.

This observation relates to the second point raised by Jansen et al.'s critique of *The New Peasantries*. Van der Ploeg's celebration of peasant autonomy, they argue, implicitly portrays dependency in negative terms. Since dependency is "an inherent characteristic of being human and part of society" (Jansen et al. 2022, p. 501) they call for analyses focused less on farmers' autonomy and more on the effects of their different dependency relationships.

On one hand, network studies of the larger agri-food system show how farmers' dependence on highly consolidated upstream and downstream industries limits their options and increases their vulnerabilities (Ashwood et al. 2022; James et al. 2013). On another, studies of the peer networks forged by organic, no-till and otherwise non-conventional farmers find that members depend on each other's knowledge and moral support not just to manage day-to-day challenges, but also to free themselves from old ways of thinking (Blesh and Wolf 2014; Hassanein and Kloppenburg 1995; Kroma 2006; Laforge and McLachlan 2018b; Rosenzweig et al. 2020; Skaalsveen et al. 2020).

Our own research drew on these bodies of scholarship while also identifying at least two ways to extend them. First, we found that the analytical distinction between macro-scale "agrifood networks" (James et al. 2013) (more commonly referred to as value or supply chains) and farmers' interpersonal networks does not capture a reality where the local agrochemical dealers (and dispensers of chemical-intensive advice) are often fellow farmers as well as neighbors or in-laws. Some are now also carbon program recruiters. Although these agents are not necessarily corporate ciphers (Comi 2019), it is worth considering how their more-than-business relationships with farmers may complicate efforts to transition away from particular products and practices.

Second, neither the different scales of network studies nor the overlapping literatures on farmer autonomy and technology sovereignty – all concerned with the relationships that affect farmers' livelihoods—have engaged much with scholarly work on more-than-human relationality (Argüelles and March 2023; Darnhofer et al. 2019; Tironi et al. 2020). This work does not simply accept that dependency comes with "being human and part of society;" rather, this is a core ontological premise (Krzywoszynska and Marchesi 2020). And RA has proven fertile empirical ground for relational analyses, with a growing number of studies documenting how regenerative farmers come to appreciate their dependence on the many organisms that build soil health (Gordon et al. 2022; Gosnell 2021; Gosnell et al. 2019). With this mindset shift, farmers recognize both the limits of their control over nature and their need for different ways of knowing and working with it (Kallio and LaFleur 2023; Krzywoszynska et al. 2020; Miller-Klugesherz and Sanderson 2023; Seymour and Connelly 2023).

In the growing literature on the more-than-human dimensions of RA (see also Cusworth et al. 2023; Duncan et al. 2020), Krzywoszynska's research is especially attentive to the larger political economic forces that influence farmers' soil care practices (Krzywoszynska 2019, 2020). The English farmers she studies recognize the bottom-line benefits of healthy soil, but also face bottom-line constraints on what

they can do to promote it. Some say that their land would be better off as pasture, but as producers of low-priced commodity crops, they would soon go bankrupt. Elsewhere she observes that the agribusinesses that buy those crops expect RA to generate economic and ecological "win wins" (Krzywoszynska 2020). In other words, they expect well-tended soil biota to help sustain farmers' high yields, ecosystem functions, and the broader capitalist project of accumulation through agricultural intensification. This analysis suggests that corporate carbon programs may be less about greenwashing (in the sense of "greening" brand image (de Freitas Netto et al. 2020) than about keeping farmers on board with that capitalist project. It also reminds us that the more-than-human care that by some accounts defines the 'regenerative mindset' (Seymour and Connelly 2023) does not by itself necessarily challenge power relations at work far beyond the farm – within supply chains, for instance, or government subsidy programs. This is why our own analysis also attends to farmers' understanding of RA as a means to greater autonomy achieved not just through reduced need for external inputs - one dimension of technology sovereignty - but also through the knowledge and support they gain through relationships with other farmers.

Background: roots of a movement

The settler family farm, which represented a new form of specialized commercial agriculture...was itself industrial.

(Friedmann and McMichael 1989, p. 100)

Settler colonial agriculture in the Great Plains depended on industry from an early date and fueled its growth. Its contributions to U.S. economic development owed to not just the abundance of the Indigenous lands that settlers occupied (Carlos et al. 2022), but also the increasing availability of the technologies needed to make those lands productive. And whatever aspirations settlers brought with them, land speculation, indebtedness and later falling grain prices meant that keeping the family farm often required making it bigger (Friedmann 1978; Gates 1942). Settler farmers' demand for labor-saving tools – reapers, threshers, later combine harvester-threshers—made them an important market for U.S. industry, just as their increasingly abundant harvests fed both industrial workers and the growth of U.S. food processing (Friedmann 1978).

In the southern Great Plains, a region where Indigenous populations had for centuries managed the landscape more for bison hunting than agriculture (Cunfer and Waiser 2016), mechanized settler farming also devastated the prairie soils,

helping precipitate the 1930s Dust Bowl (Worster 2004). New Deal soil conservation programs instituted new farm management practices, now visible on the landscape as cedar hedge rows and terraced hillsides. But if those programs successfully inculcated new “agri-environmental” subjectivities in Great Plains farmers (Laforge and McLachlan 2018a), they had little effect on the norms that equated *good* farming with tidy fields and “feeding the world” with ever-increasing yields (Burton et al. 2020; Comito et al. 2013). Nor did they temper the competitive pressures fueling agriculture’s “treadmill of production” – the cycle in which farmers’ adoption of productivity-enhancing technologies drives resource consumption up and farmgate prices down, leading to ecological and economic crises that in turn drive the next round of technology adoption (Dudley 2002; Levins and Cochrane 1996; Sanderson and Hughes 2018; Schnaiberg 1980).

These norms and pressures shaped the early history of the Great Plains RA movement more directly than did prevailing visions of low-input or sustainable agriculture. The Rodale Institute’s 1983 definition of RA (often credited as the original) emphasized that it “produces foodstuffs free from biocides” (cited in Giller et al. 2021; Rodale 1983), but that same era saw increased use of particular biocides – broad-spectrum herbicides such as dicamba, paraquat and most famously glyphosate – in place of tillage (Lessiter & Lessiter, 2022; Triplett and Dick 2008; Werner et al. 2021). At the time, reduced or no tillage was heralded as a boon for “erosion weary farmers” (Sterba, 1982). Companies such as Dow Chemical and John Deere backed the “no till revolution” with R&D that brought down prices for the necessary chemicals and equipment (Bless et al. 2023). “As usual, economics is the main motivating force,” wrote the *New York Times* in 1982, “not plowing has become cheaper than plowing” (Sterba, 1982).

Not so cheap were the increasing quantities of agrochemical inputs that no-till farmers needed to combat herbicide resistant weeds while still increasing yields. Looking for ways to cut input costs, some no-tillers began exploring a broader range of soil health practices in the 1990s. These practices correspond to a set of principles widely recognized as central to RA: to minimize soil disturbance (i.e. through no till), keep soils covered and planted with living roots in the soil year-round (i.e. through cover cropping), increase plant biodiversity (i.e. through multiple crop rotations) and integrate crop and livestock production (also known as holistic management) (Gosnell et al. 2020; Newton et al. 2020). Although Indigenous communities around the world have long recognized the value of these principles (Carlisle

2022; Sands et al. 2023), in the Great Plains they became the basis for a new regional movement.²

Initially an informal network, by the late 1990s the movement had taken more concrete form in No Till on the Plains (NTOP), an organization that, despite its name, has always attracted farmers looking to go *beyond* no-till. While the practices it advocated spread gradually through the 2010s (Greenaway 2018), the annual NTOP winter conference saw surging interest in the early 2020s, when input costs spiked by 25–30 percent in a single year (Clayton, 2023). During the same time period, federal funding for RA increased (a point we return to in the conclusion), major food brands, agribusinesses and ag-tech startups announced RA commitments and/or the launch of carbon programs (Casey & Lucas, 2023; Creswell, 2022), and the popular documentary *Kiss the Ground* portrayed RA early adopters as climate change heroes. This publicity and institutional support for RA prompted our interest in farmers’ own understandings of their RA transitions.

Methodology

The paper is based on a National Science Foundation-funded study (grant# 2121246) of emergent visions of regenerative agriculture in the United States. Although the study is multi-sited, the data for this paper comes primarily from fieldwork undertaken in the southern Great Plains during the winters (January–March) of 2022 and 2023. We conducted 82 semi-structured interviews with farmers in Kansas ($N=37$) and Nebraska ($N=45$). We established our initial contacts at soil health events that we attended early in the project. Using snowball sampling (Noy 2008), we then built an interview sample that spanned high and low rainfall zones and that included farmers of different ages and with operations of different sizes and types (some pure row crop producers, some mixed grain/livestock, some highly diversified) and with varied levels of RA experience. And although the Great Plains RA movement is overwhelmingly white, we also interviewed several Indigenous and Black farmers and seed savers about their work to reverse historical inequities in land access (Herbers 2023; Horst and Marion 2019).

Most interviews took place on farms and included tours of the land and operations; most lasted 1–2 h, though some ran longer. All were recorded. The interview questions asked about farmers’ operations, their personal backgrounds and their families’ farming history, their understanding of,

² The Indigenous origins of these principles received little attention at the movement events we attended. But a handful of the farmers we interviewed were active in RegeNErate Nebraska, a group that started from the premise that “Regeneration is a Native concept” (RegeNErate Nebraska, n.d.)

experiences with, and sources of information about RA and soil health, and their involvement with carbon programs. After finding few farmers already enrolled in such programs during the first year's fieldwork, we planned for the second year's fieldwork to include several farmer focus group discussions on carbon programs. We publicized and conducted most of these discussions ($N=7$ groups, 35 participants total) at farming conferences. Altogether roughly 25 of the 117 farmers we spoke with were enrolled in carbon programs.

Besides the farmer interviews and focus group discussions, the paper draws on (a) 24 in-depth interviews conducted with representatives of companies that either run or support carbon programs, (b) field notes and transcripts from a wide range of both in-person ($N=28$) and remote ($N=36$) events, such as food industry and farming conferences, soil health field days, and carbon program webinars, and (c) news articles and commentary on RA, soil health and carbon programs from both the mainstream and farming/agrifood media. We analyzed the data iteratively (Srivastava and Hopwood 2009), starting with codes derived from the literature that informed the study's primary research questions. These questions centered on (a) how different individual and organizational actors envision RA and its benefits, (b) how they attempt to enroll others in their visions through concrete initiatives such as (but not limited to) carbon programs, (c) how they assess and demonstrate evidence of progress towards those visions, and (d) how other actors respond to the initiatives and evidence. After coding data from the first year's fieldwork, we refined the codes to analyze emergent themes more closely. These included farmers' visions of greater autonomy through RA, and the different kinds of relationships and forms of knowledge that they saw either helping or complicating their efforts to achieve that vision. We used Atlas.ti for all coding. As we developed the paper's argument we also returned to the audio recordings of the most relevant interviews and focus group discussions to listen for expressions of emotion, uncertainty, or any other nuances in meaning not captured by the transcripts.

Freedom from the treadmill?

America was built on rugged individualism. Now, rugged individualism has been influenced negatively by Big Ag and these big corporations... They have ruined rural America.

David (Kansas Farmer)

The farmers we spoke to mentioned a range of concerns that led them to RA, from the dangers of chronic pesticide

exposure to the perceived decline of rural America. But the most common theme was the hope that RA could free them from the "Big Ag" technology treadmill while assuring them better profits, or at least a steady living. Adam (all names are pseudonyms), a Nebraska farmer in his mid-30s who had returned to his family's farm after several years at a city job, described how he had come to see that farming conventionally was "stupid:"

We buy these million-dollar machines...then you dump [on] a bunch of fertilizer and pesticides...and that's also super expensive – to grow a really low-value commodity...And I'm like, this is stupid, like we are spending bazillions. Like you gotta spend a million dollars to make 1 million and maybe 40,000 dollars, you know what I mean? So the risk is just insane.

He went on to describe how his family first planted cover crops in the early 2010s mainly to suppress weeds and stem the "ever-increasing" input costs. "Commodity prices were just in the tank for a lot of years, he said, "and we had to do something different." Other farmers shared similar stories of turning to RA at a time when, as Frank a middle-aged Kansas cattle farmer, put it, "your back's against the wall." This usually referred not to acute financial crisis, but rather weariness with the boom-bust cycles typical of conventional commodity agriculture. Harold, a recently retired Nebraska farmer, recalled that he started looking into RA because "it was getting harder and harder to make money" running his family's cattle feedlot, and "it's not fun when you're not making money." Michael, a new-to-RA Kansas farmer, similarly, was tired of running his farm "basically at breakeven":

"...the only thing that's kept us ahead of commodity prices...is our ability to innovate and be efficient. So for years and years and years, we concentrate on...a 'least cost producer' kind of mentality...You know, the definition of insanity is doing the same thing and expecting different results.

Early adopters had few role models to give them confidence in the economic viability of RA, though some mentioned that they aspired to the relative self-sufficiency of past generations. These days, however, RA success stories abound. Some of the most successful RA farmers tell their stories regularly at soil health conferences and in the farm media. Among the best known is North Dakota regenerative farmer Gabe Brown, whose book *Dirt to Soil* tells the story of how, in his own words, "I took a severely degraded, low-profit operation that had been managed using the industrial production model and regenerated it into a healthy, profitable

one” (Brown 2018, p. 1). It follows in the tradition of sustainable agriculture “epic narratives” that both portray the narrators as heroes (other examples include Allan Savory and Wes Jackson) and promote principles for others to follow (Cabral and Sumberg 2022).

For new adopters such as Michael, the successes of ‘celebrity farmers’ (Phillipov and Goodman 2017) such as Gabe Brown encourage visions of regenerative “win-wins” (Krzywoszynska 2020, p. 228) in which healthier soils lead to healthier balance sheets. Michael recalled listening to *Dirt to Soil* while mowing his lawn. “Lightbulbs started going off left and right in my head!” Having grown up on a farm, he studied agronomy and then worked as a crop consultant at a time when that mainly meant pushing chemicals. Few questioned what he called the “grow more, put on more, grow more” model. But now he was confident that as the health of his soils improved, he could profitably put on less. “Once we get to the other side of this, the ROI (return on investment) is going to actually be greatly improved.” And that was the goal. “It’s not an environmental decision,” he said about his transition to RA, “it’s a money decision” – though, he added, one that could have “an environmental kickback.” As Frank observed, cutting back on chemicals was not the only way to come out ahead. “The biggest part of the money making in regenerative agriculture is the savings. That first year, when we got rid of equipment, we took a million dollars off the books.” For Adam, bringing livestock into the fields cut costs further. “I can grow a cover crop that gets grazed. And then the next year, I can cut my nitrogen inputs by 20 or 30% and still grow better corn than I would have grown otherwise.” A minority of the regenerative farmers we interviewed aspired to or already had organic certification, which they saw as the surest way to access premium markets. But most liked the option to use conventional inputs if they needed them. As David, an early adopter from Kansas put it, “I would love to go organic for the money side of things. But at the same time I want the tools in the toolbox.”

Adam was one of a number of farmers who enjoyed the intellectual challenge of making RA profitable, and who saw themselves as more enterprising than their conventional peers. Referring to corn farmers who “just nuke everything with fertilizer and herbicides,” he said:

There’s no strategy. There’s no learning. It is very much status-quo and hope that you can market your grain a little bit better next year...to me, that sort of farming is exceptionally boring. And I would say that’s 95% of farmers out there. They don’t really do anything that’s super interesting. They just try to do the same thing over and over, just maybe a little bit better than next year. Which usually means buying more

advanced equipment or buying more fertilizer or more fungicide or whatever.

Adam hoped to become an RA consultant one day, because he was already dispensing advice and “at a certain point you’ve got to charge for your time.” But other farmers, like Henry, a middle-aged Nebraska farmer, simply found the diversity of crops and activities that came with RA “a lot more fun” than corn and beans. Edward, a middle-aged farmer from Kansas, said regenerative farmers were happier than their conventional peers because they were “not in the rat race.” Instead, “every regenerative farmer I know absolutely loves what he does, can’t wait for next year, because there’s something else he’s going to do...that’s how we are.” For Harold, the “something else” was digging a pond for wildlife:

A lot of people say, well, big deal. It’s fun to look at wildlife, but how’s that going to help your farming? And to me, it’s like, there’s enough stress and worry in farming that if you can just take a few minutes every day and observe and see. (Pause) And even while you’re working, if you look up and see a pair of Canada geese flying over, you know they have a nest in your pond. It’s just something to invigorate you and relieve some of that worry and stress.

Subsidies and strange looks

The better ROI that farmers sought in RA, then, was not purely monetary. New adopters hoped for more freedom in two senses (Berlin 1959; Stock et al. 2014): freedom to do what they enjoyed, such as experiment with different crop varieties, and freedom from conventional agriculture’s dependencies and stresses. But realizing the latter form of freedom was not easy for farmers whose families had farmed conventionally for generations. It is unsurprising that the most “peasant-like” farmers Nelson and Stock (2018) found in Kansas – all organic, highly diversified, and producing for local markets – came from other professions, and did not start farming until they had gained “sufficient community support and/or financial independence” (Nelson and Stock 2018, p. 92). Many of the farmers we spoke to either previously or still held other jobs, in some cases working for the agribusinesses that are some of the region’s biggest employers, and even they struggled with what Henry called the “dollars and cents” of transitioning to RA:

Corn and soybeans are just such major players around here, especially since our government got involved in

subsidizing the ethanol industry. It has given corn such an economic advantage that it's just really tough to compete with...So that was the biggest hurdle - just getting over the corn and soybean mentality.

Some government programs help to counter that mentality, such as the Natural Resources Conservation Service (NRCS) cost-sharing initiative that helped Henry get started on cover crops. By contrast, the federal rules governing subsidized crop insurance eligibility have until recently disallowed the use of practices that might even temporarily lower yields - including practices known to enhance soil health (Moran, 2023).³ Forrest, a Nebraska farmer in his 30s, echoed a common view when he said that he saw RA as a way to build a farm “resilient enough” not to need crop insurance, given the strictures it imposed. Although he still insured some of his crops, he said, “maybe I should just be keeping that money and reserve it for when I need it. Have my own emergency fund.”

Landlords are another common hurdle (Ranjan et al. 2019). Michael said that while one landowner had encouraged him to plant cover crops, he had to convince several others that his RA practices would not just reduce input costs but also eventually improve their property values. “That was my biggest concern – making sure my landowners were on target with the decision we were making.” Forrest recalled that he got no such trial period from one landlord, who ended his lease and rented instead to a nearby corn and bean farmer with “expensive, big, shiny equipment.” He imagined the landlord thinking “I don’t want to be associated with this guy who does weird stuff.” As Elias, a Kansas farmer who worked with his two grown sons, observed, the fact that most leases were verbal meant that “as a tenant, you don’t want to rock the boat.”

Elias also noted that most landowners were absentee, with little connection to either the land or locality. Neighbors and family members, on the other hand, were quick to notice “weird stuff.” Adalynn, an early adopter and RA advocate, observed that farmers’ local business relationships were usually also social ones. “Chances are that you’re buying seeds from the guy you went to highschool with, you know, you go to church with him, and then you try something different...relationships are gonna change.” This might just mean neighbors slowing their cars to gawk at your cover crop of sunflowers (as Henry had experienced) or getting strange looks at the coffee shop or co-op (widely experienced). But as David pointed out, a multi-species cover crop “looks kind of trashy. Maybe a lot of farmers will go to the

landlord and say, ‘Hey, see what your tenant’s doing to your land. I can have that field clean tilled for you.’”

These farmers’ experiences with social ostracization as they adopted RA practices are neither new nor uncommon (Blesh and Wolf 2014). Neither are they universal. Some farmers lived in areas where such practices had been around for a while and were now more or less accepted; others said that their neighbors’ attitudes changed once they saw visibly healthier crops and livestock. What interests us here is how the challenges of adopting RA practices may also challenge farmers’ ideas about what knowledge, relationships, and freedoms most matter for their own success and satisfaction. The farmers we spoke to tended to describe their RA transition as a journey or path; the next section explores some of the most common activities, sites, and experiences along that path.

“Relationships are gonna change”

The unlearning process is huge.

–Frank, Nebraska farmer

One of the first things new adopters of RA learn is that they need alternatives to their traditional sources of information and expertise (Rust et al. 2022). Although the major corporate agrochemical and seed companies have recently begun promoting RA themselves – whether as part of their carbon programs and/or to sell new products and services – none of the farmers interviewed mentioned learning about RA from those companies or their local dealers. If anything, they considered this one of conventional agriculture’s fundamental problems: the influence on farmer education of “those with money wanting to sell a product,” as Irvin, a Kansas farmer, put it. They saw this influence both at the land grant universities that some farmers had attended and in the advice dispensed through local ag retailers and coops. Finn, who farmed with his son in Nebraska, recalled that as a conventional farmer, “the system told you what to do. If you wanted to know what your fertility [fertilizer] program was for the farm, you asked the person who sold it to you.” And that person is usually not just the fertilizer salesperson. As Barry, a middle-aged Kansas farmer, noted, “Half the time their agronomist or their seed salesman is their brother or their brother-in-law or their next-door neighbor. It’s pretty hard to fire them.” Frank framed relationships with local ag-industry representatives in even stronger terms. “I always tell people that farmers or ranchers suffer from the Stockholm Syndrome,” he said, “because we’ve become friends with our captors.”

³ In November 2023, the USDA revised its Good Farming Practices handbook to allow farmers using “USDA approved conservation practices” to remain eligible for insurance (German, 2023).

Many farmers first heard about RA on their own, as when Michael listened to Gabe Brown's book while mowing the lawn. John, a Kansas farmer and crop advisor, observed that this sort of learning was one of the silver linings of the COVID-19 pandemic: "COVID was wonderful for regenerative ag because people didn't have activities to go to. They just sat at home, and a lot of them discovered that there was some good material out there to read or watch or listen to. And they learned a lot." Even before the pandemic, some RA experts had gained significant online followings. Among the best known is soil microbiologist Elaine Ingham, whose Soil Food Web School offers videos and online courses on topics ranging from the practical (how to make compost tea) to the philosophical (why the liveliness of soil matters) (de la Bellacasa 2015). Like other popularizers of RA, Ingham emphasizes how much it can reduce farmers' input costs, provided they are willing to recognize that soil microbes and earthworms are their "essential workers" (Ingham 2023).

Even if farmers first encounter these ideas by themselves, they often turn to organized events both to learn more and, equally important, to find like-minded peers. In other words, the process of becoming regenerative tends to pull farmers into new and often extra-local social networks (Skaalsveen et al. 2020). The events where this happens range from cover crop field days to multi-day workshops organized by individual farmers and RA advocacy groups (Fuller Field School, Beyond the Yield) to NTOP's long-running summer bus tours and winter conference. The tours visit experimental no-tilled fields at the Dakota Lakes Research Farm in South Dakota as well as Gabe Brown's ranch in North Dakota. Partly educational and partly social, they have a loyal fan base: some farmers from the inaugural tour in the 1990s were still riding the bus in 2022, along with relative newcomers. NTOP's winter conference, meanwhile, draws hundreds of people for a program that invariably includes a large proportion of veteran RA farmers. Among them are the "celebrities" well known for their successes in RA and related ventures as well as their talents for inspiring others. John recalled how, at his first NTOP conference, he wandered into a talk by John Kempf, a farmer turned "entrepreneur, speaker, podcast host and teacher" (<https://johnkempf.com/#about>), and came out with his "mind blown." Barry, similarly, said that for first-timers, attending the NTOP conference was "like drinking out of a firehose."

The challenge comes afterwards, Barry added, when farmers return home to skeptical family and community members. This makes the networking aspect of events like the NTOP conference all the more important. A former NTOP board member saw this as the primary benefit of the early conferences: attendees enjoyed meeting others "who were open minded and looking down the same path

they were looking down." Both at events and through other channels (i.e., social media), one outcome of networking has been the development of what some farmers described as "support groups" (cf. Hoffschneider, 2023). While farmer-to-farmer sharing has long characterized agroecology movements, especially in the global South (Rosset and Martinez-Torres 2012), participating in such a group may be a novel and awkward experience for farmers socialized to enact "competitive self-reliance" (Gahman 2020, p. 167). But at one group's monthly meeting in the winter of 2023, five members described how they valued getting away from that norm.

Originally convened by a Nebraska extension agent, the group's members were not neighbors, but farmed close enough together that, as Ned put it, "if it works on Peter's farm or Rendy's farm, there's a good chance that it will work on mine, and vice versa." More importantly, they felt they could learn from the other's strengths, as well as their successes and failures. "Some of the guys around this table are a whole lot sharper than me when it comes to understanding soil sampling and stuff like that," said Ned. "So coming and listening to them, I can take some of this home and understand better than from just asking the guy at the coop, who's the one selling me the fertilizer." Peter added that the sharing of experiences "moves your thoughts forward faster, and maybe emboldens you to try more progressive and different things than you would have otherwise." If an experiment failed for one member, said Ned, "as opposed to 'shoot, I screwed it up this year and I gotta wait a year'... I can still watch the other four guys." After mishaps they could also count on the others for sympathetic humor.

"With this group, I think I'm a lot more willing to share my mistakes, you know, I'm not going to share with a neighbor across the road because he's gonna laugh at me and say, 'What the heck are you doing in the first place?' It looks stupid... [But] I can text you a picture and we can laugh about it (laughs).

The extension officer noted that the groups' members had supportive landlords and fathers (all were in their 30s and 40s), which meant they enjoyed secure land access. They also had more water than farmers in western Kansas and Nebraska, where low rainfall and the depletion of the Ogallala aquifer make certain RA practices more challenging, if not impossible. These advantages meant that the farmers in the group could afford to try out things that others might consider too financially or agronomically risky. That said, their curiosity about different RA practices was hardly unique. Experimenting, observing, tinkering – while not practices unique to *regenerative* agriculture (Higgins et al. 2023; Mol et al. 2010), farmers considered them essential to

making their own farms more regenerative, and their own work more fulfilling than the “boring” routines of conventional agriculture (Comi 2023, p.3). Their experiments took varied forms and took place over varied geographic and temporal scales. If better soil health was a primary objective, it was hardly the only one, and often not what they assessed directly. Alice, a Kansas grain/livestock farmer who practiced rotational grazing, paid attention to the height of the grasses her cows ate, as well as their own signals that it was time for fresh pasture. “They’ll let you know. They’ll start bawling.” Vince, an organic crop/livestock farmer, tried running hogs on pasture to see if their feed efficiency would improve (it did); he also found they rooted up troublesome bindweed. Adam, one of the many farmers experimenting with cover crops, said that while he initially just wanted to know which species suppressed weeds best, now he appreciated that he could “design” a cover crop mix to suit the needs of a particular field or season.

Farmers’ experiments drew on diverse tools, data sources and ways of knowing (Kallio and LaFleur 2023). Some consulted their college agronomy textbooks; some took Elaine Ingham’s online “soil food web” courses or attended composting workshops taught by Ingham’s trainees. Most at least occasionally sent soil samples out for laboratory testing but had mixed opinions about the worth of different tests. Many suspected that traditional soil fertility tests primarily served agrochemical industry interests and saw greater value in tests of soils’ biological activity.⁴ But none relied on tests alone to determine the effectiveness of their RA practices. During farm visits they dug up soil to smell and feel, pointed out root structures, and turned over cow pies to reveal the earthworms underneath. Frank said of his shovel, “this is the most important tool we have on the farm right now. We just dig.”

Most farmers we met managed anywhere from a few hundred to a few thousand acres, and regularly needed tools much bigger and costlier than a shovel. Nonetheless, Frank’s comment spoke to a vision of autonomy - or technology sovereignty (Montenegro de Wit 2022) - centered on not just fewer external inputs, but also more knowledge. For Forrest, the two went together. He said he decided to go “all in” on RA once he realized that it could help him achieve what he understood by independence: being able “to make a living with minimal inputs from others.” This did not mean with no help from others - he belonged to a

“support group” of RA farmers - but rather “observation, learning yourself, and not relying on a crop scout to tell you what you need to apply to your farm. We talk about being stewards of our land. You’re not a steward if you’re relying on everyone else to tell you how to manage your property.”

Independence was a key reason why Forrest and several other farmers had bought microscopes. As he put it, “don’t tell me what’s in my compost, I want to know, and I want to be able to identify what’s there.” Using slides from a compost workshop he attended, he was learning to distinguish beneficial organisms from harmful ones. Patrick, an early-adopter Nebraska farmer who bought a microscope after starting an online Elaine Ingham course, admitted he was still learning how to use it. But he considered it a necessary tool for becoming truly regenerative, which for him meant “farming under the surface. And not on the surface. True regen is only going to work if you have the soil biology - and in a big way, not just kinda... You gotta have the whole system. It is so complicated.”

If the aim of understanding life “under the surface” was greater self-reliance in both inputs and knowledge, one effect was greater appreciation for the many kinds of more-than-human relationships - under and above ground - that this self-reliance depended on. David recalled witnessing one such relationship when he first started planting radishes and other companion crops (sometimes also called “nurse” crops) in his wheat field:

The daikon radish will, you know, go deep into the soil. Wheat roots will literally wrap around the radish and follow it down. So there’s some kind of interaction going on there. When I first tried it...the ground was frozen about an inch deep. So I took an ax and found a nice radish... and dug it up and saw the wheat roots wrapped around it. One of my aha moments. That was really cool to see.

Farmers talked about how both “aha moments” and the gradual accumulation of knowledge had changed not only how they farmed, but also how they thought about their work as farmers. Drew, a longtime RA practitioner in Nebraska, remembered one such moment. “I heard Gabe Brown say one time, ‘I used to wake up every day and say, what am I going to kill today?’ I thought, That’s exactly what I do. I wake up every day and think, what weed am I going to kill, what pest is my problem? So, I don’t think that way now.” Instead he saw pollinators and cover crops helping him get “more life into the system” that would eventually yield cash crops. Harold, the former feedlot owner, now saw himself feeding a pasture ecosystem. He mentioned spotting tree frogs and bobwhite quail amidst the cover crops where cattle were grazing. “They all coexist.”

⁴ The best known is the Haney test, which evaluates soil respiration and nutrient cycling (Haney et al. 2018). Some farmers also mentioned using the phospholipid fatty acid (PLFA) test, which measures soil microbial biomass (Sundermeier, 2019). A growing number of start-ups, such as Trace Genomics and Biome Makers, use DNA sequencing to identify microbial populations. But these tests are much more expensive; only one farmer mentioned using BiomeMakers’ “BeCrop” test.

For Adam, embracing RA principles meant understanding that your chief task as a farmer was to “figure out how to feed your microbial life properly.” In practice, though, he said he was “still on the path” to becoming fully regenerative, because his harvests of corn, soy and other commodities still relied on chemical fertilizer and herbicides. Weaning the farm off that reliance would require time to build up not just the health of the soils in his fields but also his own knowledge of what those soils needed and what, practically, he could provide them.

Even farmers with much more RA experience than Adam emphasized that they too were still figuring things out. As David said about himself, “been at it for a while and so much to learn yet. The more I know the dumber I am!” Drew, who had gained enough renown in the RA world that others often sought his advice, joked that “I tell people I am ignorance on fire, but they are more ignorant than me.” If this sort of self-deprecation reflects a common source of humor among RA farmers, it also suggests that what defines the work of regenerative farming is not just the feeding of microbial life but also the figuring out. While conventional farming is increasingly guided by agrochemical and seed “prescriptions” - often uploaded directly to growers’ “smart” field equipment (Pham and Stack 2018) - regenerative farming requires ongoing observation and adaptation. And while on a day-to-day level much of that work is relatively solitary, the figuring out also depends on the different kinds of help RA farmers get from one another. Farmers’ emphasis on the value of this help - whether coming from members of their soil support groups, attendees at an RA event, or others - suggests, in turn, that what defines the Great Plains RA movement is more than a collective appreciation for soil microbes and the practices that best feed them. Keith, a member of the soil support group we visited, talked about why regenerative farmers might be more inclined to share equipment.

I would say regenerative farming, organic ag, in general they're more that way. Because someone doesn't already know how to do that stuff. They're already talking with each other. And they're like, "could you help? Or can I borrow this piece of equipment, because I only have like 20 acres to try this on, I'm not gonna buy a piece of equipment for that!"...It's made farms small - that small farm mentality again, a little bit...otherwise, it's just bigger, faster, stronger, as far as commercial ag is concerned. So "how can we cover 4000 acres the fastest."

“Small” in this context referred not to the size of regenerative farms (again, in the Great Plains some are quite large) but rather a mentality that acknowledges and welcomes

interdependence. In particular, Keith and many of the other farmers we met welcomed relationships that helped them gain both kinds of the aforementioned freedoms (Stock et al. 2014): that is, freedom *to* experiment and otherwise farm in ways they enjoyed, and freedom *from* the treadmill pressures driving conventional farmers to buy ever “bigger, faster, stronger” equipment. While they tended to discuss relations with “like-minded” peers separately from more-than-human interactions, both kinds of relationships enabled the autonomy they sought as regenerative farmers.

Carbon farming for ‘beer money’

A minority of the farmers we met saw carbon farming as worth trying, at least on a small scale. Not all were eligible; early adopters who long ago implemented all the major carbon-sequestering practices found themselves excluded from most carbon programs on the grounds that they cannot demonstrate “additionality” (Fulwider et al. 2022). Among those who did qualify, a few had signed up for programs that required relatively little commitment. Marvin, a Kansas farmer in his 70s, got his son to help him enroll a few fields with the first company that approached him. It had not yet paid much, but apart from some tedious data uploads, neither had it taken much effort. “I’ve been paid two years for doing certain things by [company X], but it’s fairly minor. I call it beer money.” And, he emphasized, “I can walk anytime.”

Dylan, a Kansas drylands farmer in his 40s, dealt with the proliferation of carbon programs by signing up for several of them. He was skeptical about the models they used to quantify soil carbon, and did not like how some companies’ programs required buying a new “biological” (typically a seed or soil amendment). Still, some of these products interested him, and with a few fields enrolled in each program, “we’re hedging our bets. Maybe one of these companies will actually get it right.” For him, the right program would be one that helped him continue his transition to RA under severe water constraints.

Most of the farmers in carbon programs viewed their enrolled fields as a form of bet hedging or crop trial, with carbon as the crop. But they spoke about the programs with little of the enthusiasm that came out when they talked about their own experiments with cover crops, compost tea or, in Dylan’s case, worm bins. Even Forrest, who had been hired by a carbon program to recruit other farmers, emphasized that generating carbon credits for that program was not his top priority. “I don’t change anything I’m doing for a silly program,” he said, “because the amount of money I’m going to get from them I would probably have a better return on

my investment somewhere else... I mean, it is a nice extra little income. But that is not going to save the farm.”

The majority of farmers we met had not enrolled in any programs. For them, the possible “extra little income” they might earn did not seem worth whatever strings were attached. To the extent that RA had helped them become less dependent on agribusiness, “carbon farming” could be seen as a step backwards. As Henry put it, “I think they want to be the exclusive marketer of your carbon credits. And I just don’t like to be tied to somebody like that... There’s a lot of people that would like to make a lot of money off of what we’re doing.”

Conclusions

Our research concluded at a time when farmer ambivalence was hardly the only reason to wonder about the prospects of private sector carbon programs. From *Science* to *The New Yorker*, high-profile publications called attention to the doubts surrounding RA’s carbon sequestration potential, the scams exposed in carbon offset markets, and the ever-increasing greenhouse gas emissions coming from food companies that claimed they could use carbon insets to achieve “net zero” (Blake, 2023; Creswell, 2023; Lakhani, 2023; Popkin 2023). To the extent that this media coverage challenged the credibility of sequestered carbon as a crop, it also raised questions about whether it would ever prove a very lucrative one for the farmers who now saw it as, at best, a way to earn “beer money.”

During this same period, however, the U.S. government began pouring billions of dollars into programs that would promote RA as a form of “climate smart” agriculture (Downs, 2023). Among them, the USDA’s Partnerships for Climate Smart Commodities program (USDA 2023b) doled out \$3.1 billion to 141 projects, some of them run by the food and agribusiness companies already running carbon programs. Most projects will offer payments and other incentives to farmers who adopt (or continue) practices that either reduce and/or sequester greenhouse gas emissions, including the soil health practices associated with RA. If existing corporate carbon programs are any guide, at least some projects will encourage enrolled farmers’ peer learning and networking (Casey, 2023). As of early 2024 many projects had yet to truly launch, but a new “Opportunity Navigator” app promised to help farmers identify their best options (Lore, 2023). Will farmers in the Great Plains and other commodity-growing regions in fact see these projects as opportunities? If so, how will they navigate the likely requirements - i.e. to share data, follow expert advice, perhaps use certain crop treatments or other technologies? These are among the questions worth further research.

For now, this paper has advanced the growing scholarship on RA by analyzing the changing relationships constitutive of Great Plains farmers’ RA transitions. We have shown that as they work to become less dependent on industrial agro-inputs and expertise, they also appreciate and attend more to their interdependent relationships with other regenerative farmers as well as with the various nonhuman species that help build soil health. These relationships and the knowledge they produce help farmers overcome at least some of the hurdles of transitioning. They also lead us to three final points about the broader significance of the Great Plains RA movement.

First, the very fact that the movement’s members are mostly large-scale, multigenerational commodity producers is itself remarkable, if not unique to the Great Plains (Beacham et al. 2023; cf. Gosnell et al. 2019). As Miller-Klugesherz and Sanderson (2023) observe, despite all the stresses that the “production treadmill” imposes on farmers, those who step off it risk losing more than confidence in their own identity as “good farmers.” They also risk losing friends, rented land, income, and federal subsidies. And while RA success stories tell them that they will eventually be rewarded with higher profits, those profits have usually not come from the premium prices that organic products command (this could change if the Climate Smart Commodities program succeeds in creating premium markets - a big if). Rather, they have come from the lower costs that the “nonhuman labor” of soil biota makes possible (Krzywoszynska 2019, 2020). Mobilizing this labor effectively takes time and attention, and often also the advice and moral support of peers.

Second, the importance of these relationships to Great Plains regenerative farmers helps to counter the idea that, as large-scale, long-time commodity producers, they are advancing a “corporate approach” to RA (Bless et al. 2023; Tittone et al. 2022). It is easy to see how research based on discourse analysis might arrive at this critique, because food and agribusiness corporations’ websites and reporting are full of RA discourse. Almost invariably it portrays companies as partners and benefactors of the farmers whose soil health practices they hope will help them meet a corporate emissions target or RA acreage commitment (Bayer, 2024; Cargill, n.d.; PepsiCo & Walmart, 2023). The farmers we met, however, saw healthier soil not as a goal they shared with upstream and downstream corporations but rather as a way to free themselves from dependence on corporate inputs, expertise, markets and, perhaps most importantly, the yield-maximizing mentality that corporate interests have long promoted.

Finally, farmers’ reliance on relationships (again, both farmer-to-farmer and more-than-human) to achieve these goals suggests that it is premature to dismiss large-scale

RA as lacking politics and a “social dimension” (Bless et al. 2023; Titttonell et al. 2022). Certainly, the Great Plains RA movement does not share the language or redistributive goals of smallholder agroecology movements, but like them it values farmers’ exchange of knowledge. Writing in the 1990s, Hassanein and Kloppenburg (1995) observed the same about Wisconsin’s rotational graziers, who today would be called regenerative dairy farmers. They noted that farmers’ knowledge sharing did more than diffuse information and build community. It also encouraged their sense of “epistemic self-reliance” (p.736) - in other words, confidence that a farmer’s “eyes and brain” (Ibid), attuned to the needs of grass and livestock, could replace many of the technologies that agribusiness would otherwise sell them. These farmers’ accounts of their work to achieve technology sovereignty sound very much like those of contemporary regenerative farmers, with one critical difference: agribusiness and food companies are much more interested in RA today than they were then. Carbon programs are one expression of this interest, and of their efforts to convince farmers that they should welcome whatever payments, tools, expertise, and markets it brings them. In a sense, these programs reflect the challenge that an RA movement in the heartland of industrial agriculture poses to industry. This alone makes it a movement worth following.

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Julie Snorek is an AAAS Science and Technology Policy Fellow serving the U.S. Department of Agriculture's Office of the Chief Scientist and a Visiting Scholar in the Department of Geography at Dartmouth College. She conducts research and facilitates conversations on how individuals and institutions are imagining, practicing and defining regenerative agriculture.

Susanne Freidberg is a professor of geography at Dartmouth College. She studies the social and political-ecological life of food supply chains. Her most recent research examines emergent imaginaries of regenerative agriculture in the United States.

Geneva Smith is a Postdoctoral Fellow in the Program on Ecology, Evolution, Environment and Society at Dartmouth College. Her research is broadly concerned with agricultural innovation, environmental justice, and the impact of settler imaginaries of land use in Argentina.