



READY OR NOT?

Ag Carbon Markets and U.S. Farmers

A Farm Journal Trust In Food™
Discussion Paper

TRUST IN
FOOD[™]
A FARM JOURNAL INITIATIVE

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ABOUT Trust In Food

Trust In Food™ is a purpose-driven division of Farm Journal dedicated to mainstreaming and accelerating the transition to more sustainable and climate-smart ag practices, making every dollar invested in conservation agriculture more impactful. We bring business intelligence to agricultural production behavior change: helping farmers understand, want and feel capable of undertaking practice change through data science, social research and strategic communications deployed through the omnichannel Farm Journal platform in collaboration with our partners.

Visit [trustinfood.com](https://www.trustinfood.com) & [farmjournal.com](https://www.farmjournal.com) to learn more.



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FOREWORD

Here at Trust In Food, the sustainable ag division of Farm Journal, we take our name seriously. We recognize that consumers increasingly want information and stories about their food. We also believe farmers are dedicated stewards of our land and waters, and that climate-smart agriculture can be a powerful force in addressing a changing climate. But we know that this will only be possible when everyone across the value chain—the farmers, ranchers

and producers who grow our food, feed and fuel; the supply partners who build markets for those products; and ultimately, the consumers and other end users who benefit from them—can trust they are all working toward complementary goals.

It has never been more important to ensure carbon programs are designed in ways producers can trust.

We've witnessed exuberance in the conservation community, the private sector and the U.S. government for using agricultural carbon markets as a tool to advance climate and food goals. In order to better understand how agricultural producers themselves feel about this new opportunity, we examined Trust In Food research over the past year to see what insights we could glean about U.S. farmer perceptions of ag carbon markets. What we found gave us—pun intended—food for thought.

Our initial findings suggest that even the most carbon-conscious farmers see notable signals that their participation in current market options would require prohibitive investments of time, effort and resources without commensurate financial and market returns.



In internal discussions of these results, we found ourselves returning to the idea of trust again and again. In theory, a marketplace in which farmers are compensated for the carbon they sequester in their operations' soil represents a paradigm shift with the potential to align farmers' economic interests and consumers' sustainability concerns. Yet the barriers to market entry are high and will require many producers to contribute substantial time and resources. These barriers include technical and economic challenges, and several forward-looking efforts have begun the work of overcoming those obstacles.

Meanwhile, the voices of farmers across the media and in the data show ever more clearly that barriers for technical and financial implementation are just one piece of the carbon market adoption puzzle. Each year, producers across the U.S. line up to stake their annual income on a few key decisions, instincts, lessons from the past and increasingly volatile weather—proving themselves some of the most risk-tolerant, innovative entrepreneurs in the world. The driver they need from the other pieces of the puzzle is not perfect certainty, but a vision of themselves in the completed picture: compelling reasons to believe that efforts will be acknowledged, that others will do their part and that costs and benefits will be shared equitably.

Farmers are waiting to see if carbon markets will demonstrate shared values, shared vision and shared skin in the game. Because all of us share this planet we call home, it has never been more important to ensure that carbon market programs are designed in ways that producers can trust.



~ AMY SKOCZLAS COLE

Executive Vice President, Trust In Food



SITUATION OVERVIEW: **TOUGH CONDITIONS AHEAD**

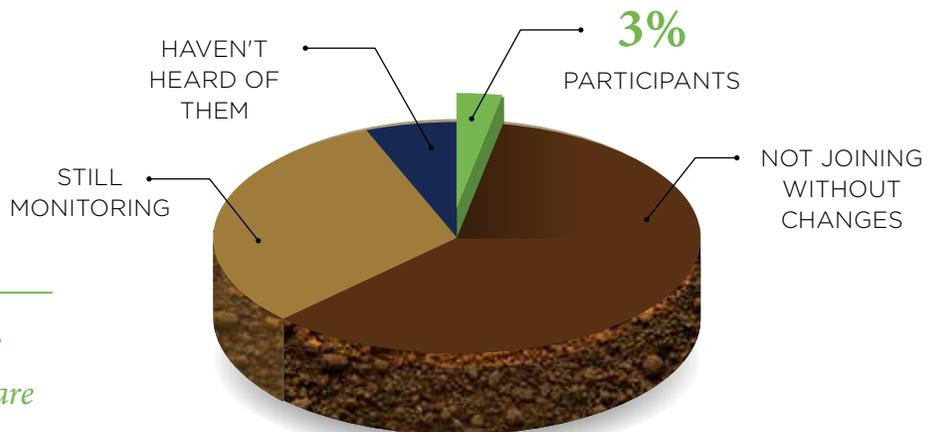
This discussion paper raises a fundamental question: How do farmers perceive carbon market vendors and offerings? The conclusions below—expanded on in further detail in subsequent sections—indicate that the road to widespread farmer adoption of these programs and practices still requires work. The information presented is intended to provide insight into potential disconnects between the industry’s hopes and farmers’ reality. Many carbon markets have been formally launched, and many more are likely waiting in the wings. We offer our analysis as feedback for carbon market developers, as well as to the many financiers, lawmakers, organizations and other stakeholders at work on this important topic.

TOP ROADBLOCKS

Carbon markets are proliferating, and farmers are aware but not ready to engage.



Though 93% of farmers have heard of carbon markets, 97% are not ready to participate.



Surveyed farmers who are aware of, but not participating in, carbon markets are divided into two groups:

- ▶ 59% don't want to join at all or won't consider it until something changes to make the offerings more attractive.
- ▶ 31% are still interested and monitoring the situation, but don't feel the time is right.



In other words, 90% of farmers surveyed need to see something different from today's landscape to consider participating in a carbon market. >



MAJOR WARNING SIGNS



A majority of farmers surveyed report serious concerns about overcoming technical and financial roadblocks to success in carbon markets.

In addition to more fundamental warning signs, producers fear that costs will outweigh benefits; that ongoing compliance will require too high a burden; that existing conservation ag practices won't be fairly compensated; that data won't be handled appropriately or will be difficult to collect; or that upfront investments will be a barrier to entry. More than half of farmers labeled each of these concerns a "significant" challenge to participation in carbon markets.



Over 70% of farmers did not use or participate in software-based sustainability tools in 2020. The majority might not see carbon credits as a compelling incentive to begin.

Widespread adoption of farm management information systems (FMIS) for use in conservation ag decision-making faces considerable roadblocks. These include poor incentives, inconsistent use in the marketplace and a lack of trusted advisers to help smooth the path to a better or greater collection of data.



Fewer than 25% of farmers participating in carbon markets report tracking their whole-farm soil carbon sequestration. Nearly 50% of those who are "monitoring things to determine the best time to enter" report tracking their sequestered carbon.

Carbon market participants are earning rewards from tracking their carbon field by field. Yet even farmers with a preexisting interest in, and record-keeping about, carbon impact doubt that now is the time to act on carbon credit offerings.

Over 70% of farmers did not use or participate in software-based sustainability tools in 2020.

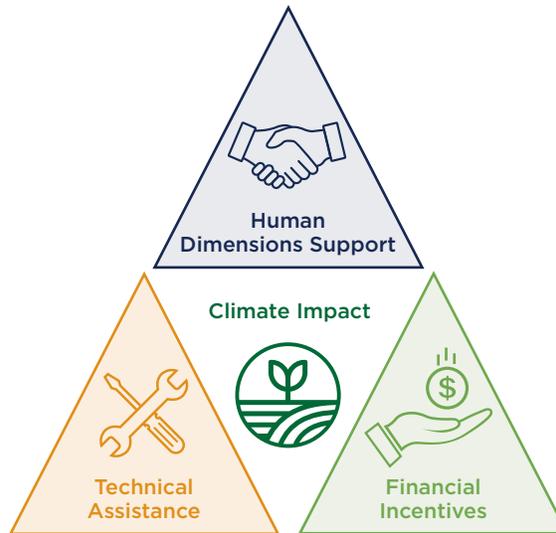


NAVIGATION



As you review this report, consider the Golden Triangle for Accelerating On-Farm Climate Impact.

While technical assistance and financial incentives are necessary to inspire and enable the act of producers changing practices, most assistance or incentive programs do not address Human Dimensions support—i.e., sustained effort to address how farmers “think, feel and take action” by showing that “the change is aligned with their values and identities, is culturally acceptable among their community and meets core needs.” Deficits in this area may be responsible for many of the following results.



See [The State of Sustainable Ag: Producer Perspectives on Pathways and Barriers to Change 2022 report](#).



There are two approaches to increasing any practice adoption: Understanding how best to market to your selected audience most likely to be receptive to your message.

The final section of the report, “Carbon Data: Finding an Affinity,” provides an overview of the kinds of information that might accelerate these goals for carbon market participation. Trust in Food’s analytic and Human Dimensions of Change Insights™ are provided as examples to illustrate how organizations might approach more informed efforts to pursue farmer decision-making change. >



CARBON MARKETS: CHOOSING TO PARTICIPATE

Conventional wisdom suggests that humans make decisions based on a straightforward calculus: Do the motivations, incentives and rewards of change outweigh the economic, logistical, psychological and social barriers in place? Our review of data gleaned from original research and beyond suggests that for the majority of farmers, this threshold hasn't been reached.

DATA AND ANALYSIS

Roadblock #1



If 97% of farmers aren't yet ready to participate in carbon markets, reports from the 3% currently participating will dictate how the platforms are perceived.

PLEASE DESCRIBE YOUR OPERATION'S RELATIONSHIP WITH CARBON MARKETS

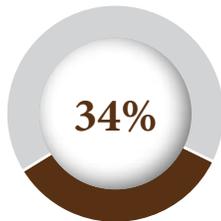
and related programs by choosing the response that best applies.



CURRENTLY PARTICIPATING
 in the carbon market or similar in 2021.



Not currently participating, but **INTERESTED AND MONITORING THINGS** to determine best time to enter.



NOT GOING TO CONSIDER JOINING until more structure is in place to protect farmers' interests.



AWARE OF THE CARBON MARKETS BUT HAVE NO REAL INTEREST, there are other financial incentive opportunities that better meet my needs at this point.



NEVER HEARD OF THEM.

Analysis

As described in our Situation Overview, the results of our research track other work done in this space, showing that only 3% of farmers report participating in a carbon market. About a third—31%—indicate they are interested in joining but are timing their entry, presumably guided by price and risk. Almost 60% indicate that they would need something to change within the current offerings to consider participating. >



This data suggests farmers might feel that, at this time, without adequate protection, carbon markets are not aligned with their interests. Reasons for this could include a lack of standardization, unclear benefits of participation or even data management and privacy concerns, among many others.

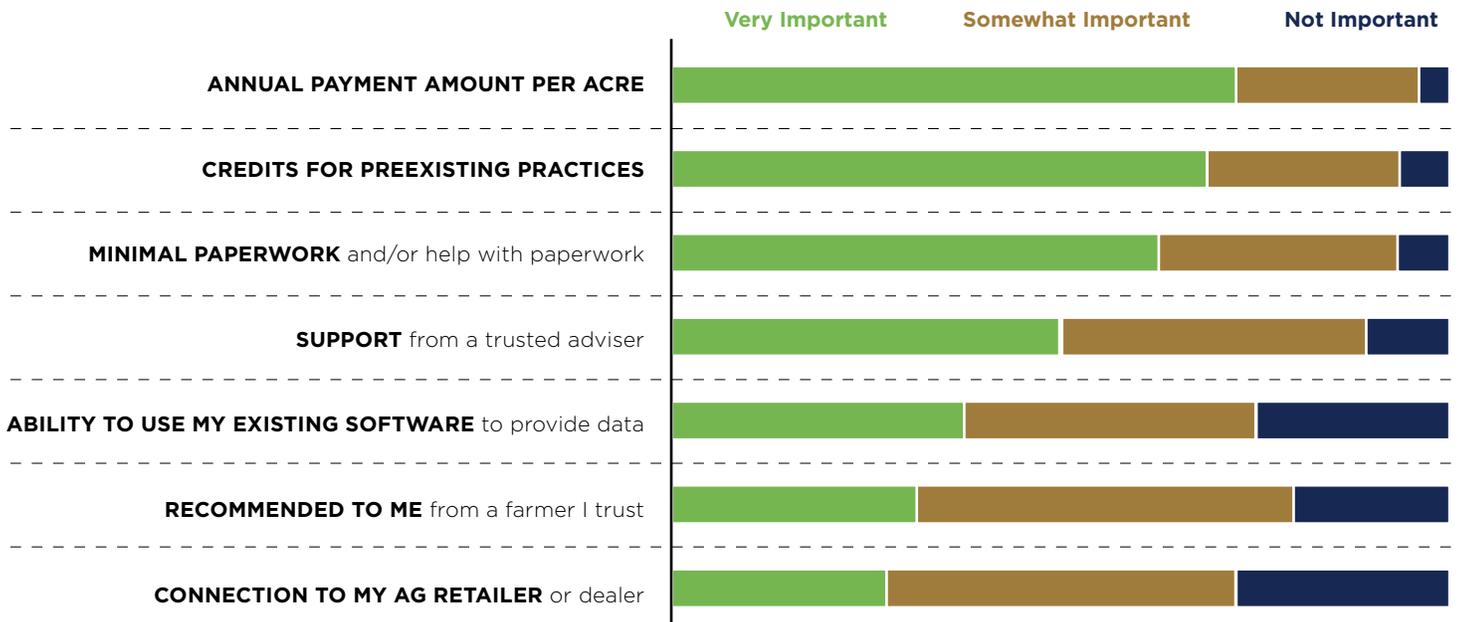
Meanwhile, the 3% of farmers who indicated they actively participated in a carbon market or related program in 2021 represent an influential cohort. As early adopters, they are approaching carbon markets as entrepreneurs branching into new products, testing whether these markets can be a good fit for their operation, or both. Their perceptions and experiences will be the first social proofs of the merits—or shortcomings—of carbon markets to their peers.

Roadblock #2



The 69% of farmers who rate “credit for preexisting practices” as “very important” aren’t just requesting payments—they’re stating their values.

HOW IMPORTANT are the following criteria to you in **EVALUATING WHAT CARBON MARKET YOU MIGHT CHOOSE** to participate in? (even if hypothetical)



Analysis

The criteria and responses above reflect the many-factored landscape farmers must consider when evaluating the potential role of carbon markets for their operations. Annual payments per acre were rated the most important criteria, reflecting the strong profit motivation of farmers. However, this straightforward and expected finding may obscure a notable signal: the second-highest response rate for the question associated with “Get credit for preexisting practices on my operation.”

On one level, this response seems self-evident—farmers would naturally want to participate in a program that rewarded them with incentives while only requiring the use of existing resources and practices. However, one farmer’s comment about Field to Market’s (2022) [report](#) on innovative finance for sustainable agriculture may help illustrate the deeper Human Dimensions explanation: “Farmers will always focus on the amount written on the check

when they are unsure of the purchase/practice.” Farmers want a fair deal and establishing their expectations of fair play is a prerequisite before many providers seriously begin to consider a carbon marketplace.

... establishing [farmer] expectations of fair play is a prerequisite before many providers seriously begin to consider a carbon marketplace.

Agricultural producers exist within a complex system of decision drivers: the ongoing need to make near-term bets on unpredictable elements like the weather, commodity prices and changing government programs, balanced against an effort to prioritize longer-term goals, such as working

landscape stewardship and planning for the next generation. In this model, carbon markets theoretically center the values of environmental and financial sustainability, but in reality, only compensate for one facet: a short-term, newly sourced/ “additional” reduction of atmospheric carbon via implementing a new practice on conventional cropland.



An “Additional” Human Dimension

“Additionality” is the principle that only *additional* carbon storage—in other words, carbon added to the soil by a farmer undertaking new practices like cover crops or reduced tillage after entering a program—should be compensated by carbon markets. From a climate science standpoint, this is logical and necessary to achieve overall reductions in greenhouse gas emissions. However, the exclusion of (for example) previously cover-cropped acres from these market opportunities also bars longtime stewards who have been implementing climate-smart practices for years already under the banner of conservation agriculture.

Some producers can recognize this disconnect as an inability to understand their on-farm values and realities. Others may see it as devaluing a practice that climate advocates claim to support. Most importantly, a vocal group of farmers feels this situation is illogical and highly unfair—and farmers who perceive that their peers are being treated unfairly are likely to remember, and act on, that impression.

To avoid inadvertently creating a rift between carbon markets and the

participants they seek to engage, carbon market providers must wrestle with the implications of rewarding “new” additional carbon storage and ignoring farmers who have spent decades implementing good practices that sequester carbon and improve soil health. These considerations serve as an important reminder that the adoption of any new idea, practice or product requires a careful assessment of the needs and perceptions of its intended audience.

Carbon marketplaces would benefit from approaching the issue from a Human Dimensions of Change perspective by ensuring they understand the core beliefs, drivers and values of farmers they wish to engage and the agricultural community as a whole. For instance:

- ▶ **Many innovative, sustainability-minded farmers**, who might be natural early adopters and central players in the movement toward new carbon markets, cannot participate under a strict additionality principle. A “you don’t qualify” today could discourage them and farmers who follow their lead from participating in related programs

>



tomorrow. Earlier adopters often have significant influence over others in their communities.

- ▶ **Barring the most motivated farmers from becoming participants** and not valuing their past efforts runs the risk of feeding underlying fears and beliefs about where carbon markets might be headed. It raises the question: “If you don’t care about what we’ve done up until now, what guarantee do we have that you’ll care about what we do once we’ve entered your marketplace?” At the extreme, it could unintentionally reinforce perceptions that these markets are unfunded mandates.
- ▶ **This structure for participation and rewards** can inadvertently signal that the current carbon market model does not embrace farmer-centered stewardship values.

“Additionality” need not stay a curse word. In a reimagined carbon marketplace, it might be recast as a motivator for the conservation practice holdouts among the agricultural community. This vision

of carbon markets elevates them beyond an uncertain tool for profitability and introduces a highly reliable gateway driver towards the adoption of sustainability practices and programs that provide benefits and incentives not strictly related to carbon.



In their current form, carbon markets are designed primarily to incentivize the soil sequestration of carbon for the purpose of sale, rather than to reward sustainable land stewardship or ecosystem services. Our research indicates it will become increasingly crucial for carbon market providers to think about—and promote—a more holistic set of benefits and outcomes to farmers, using the lens of shared values and preexisting definitions of operational success.

At the risk of generalization, our experience is that a majority of farmers view themselves as a bountiful source of food, fiber, feed and fuel for their markets, and stewards and caretakers of their land for generations to come. Failing to account for this sense of purpose, mission and legacy will most certainly result in negative perceptions of carbon marketplaces. Farmers might view them as newcomers to the industry that do not share their values. They might also see such marketplaces as seeking to take advantage of current uncertainties by extracting value from their operations at the lowest possible price, all the while requiring a lengthy heavy up-front investment of time, energy and expert advice. Further, farmers could perceive barriers such as the need to:

- ▶ Scale up record-keeping;
- ▶ Share proprietary farm data;
- ▶ Lock their farming practices into lengthy, restrictive contracts;
- ▶ Supply a new product—sequestered carbon—for which scientific analysis and quantification continues to evolve rapidly; or
- ▶ Enter what might appear to be a transient and ill-defined marketplace.

The bottom line is that such barriers can impede efforts to build trust with farmers, who might react by requiring additional guarantees before considering participation. As the chart on page 9 shows, no single evaluation criterium was rated by fewer than 73% of farmers as less than “somewhat important” for their participation.

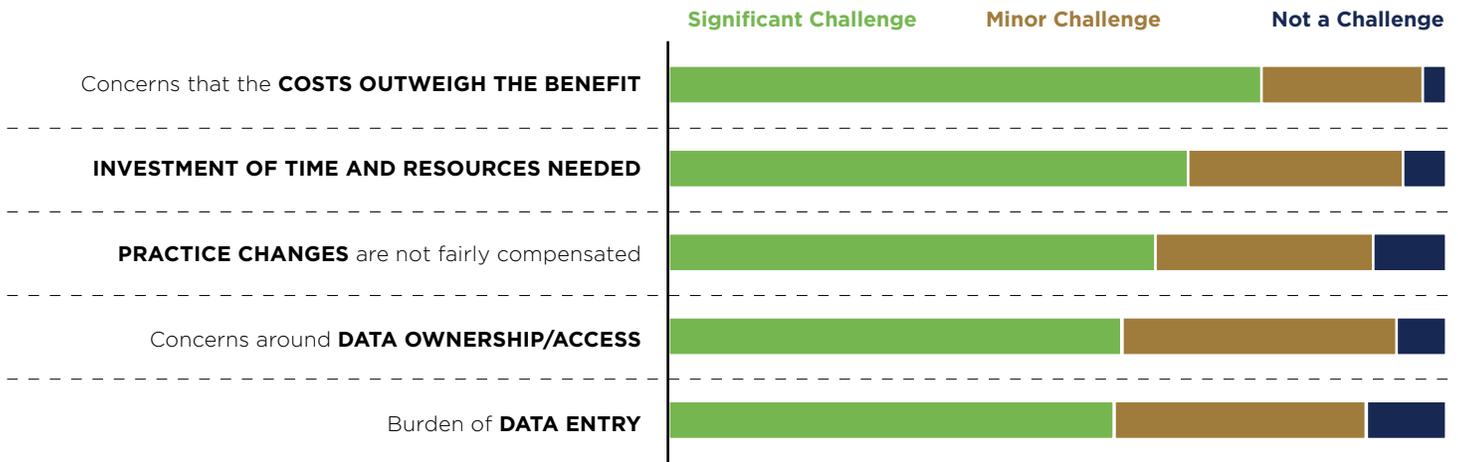


Roadblock #3



From cost-benefit analysis to data entry, most farmers surveyed see all carbon market barriers presented as “significant” challenges.

HOW SERIOUS OF A CHALLENGE or barrier would each of the **FOLLOWING CREATE** for you in joining a carbon market? (even if only hypothetically)



Analysis

Barriers reveal the underlying shape and reasoning behind why farmers make decisions. They illustrate what farmers consider important—or unimportant—in deciding whether to say yes to a new opportunity, including carbon marketplaces. Understanding and identifying paths to overcome those barriers is at the heart of the Trust In Food mission.

The figure above illustrates farmers’ top barriers when considering carbon markets. First, they need to know benefits will outweigh costs at enrollment and over the long term. Then, they need to trust that carbon-marketplace partners intend to recognize the total value of their farm operation—and to compensate them appropriately. This trust should extend to their operation’s



data, which itself merits fair compensation and protection. Farmers also want to retain ownership of their data. Once all these pieces are in place, there are practical barriers: It must be easy to participate in the marketplace, including data entry and management.

While barriers to adopting digital data processing are explored further in the next section of the report, it is necessary to address all of these factors together to “set the table” for new incentives and offerings.

BRIDGING THE GAPS



Seek early feedback and commit to action.

Early adopters should be treated as a signal to the marketplace: If their experience is negative, they leave the program unsatisfied, or efforts to market to them are perceived as predatory, this result will shape overall market perceptions for other farmers. Not only should early adopters be encouraged to share their experiences, but carbon market providers should use this feedback loop to iterate meaningful changes rather than locking into creating better messaging around an unpopular one.





Let farmers define their interests.

Carbon market offerings are pilot programs for farmers and their administrators, and success will ultimately be judged by where farmers engage and find value. Farmer participation should go far beyond determining eligibility and sign-up, with program proof of concept dependent on a rational, highly participatory framework. The results of this process should be widely publicized with the message that farmer voices and needs are being genuinely centered as part of the planning process.



Show that you value farmers.

As recently as April of 2021, a majority of farmers [reported](#) that most carbon market rates available to them held at \$20/acre or less. Broadly speaking, many farmers view this rate as insufficient. An adequate, transparent price point remains a necessary first sign that marketplaces value what farmers offer.



Show that you listen to farmers.

While price signals are a necessary first signal, we see firsthand that alone they are insufficient to drive engagement at scale. Where substantial evidence shows that farmers feel marketplaces are wildly out of sync with their values, core drivers, operational goals and understanding of their role and responsibilities, carbon markets should answer the questions:

- ▶ What information will feel relevant and resonant to producers I'd like to engage?
- ▶ What does the community and local culture surrounding the producer think, do and feel about carbon markets?
- ▶ Do I understand the underlying goals and aspirations producers have?





CARBON RECORD: **DIGITAL TOOL USE**

The economic, logistical, psychological and social obstacles to participation in carbon markets—or indeed, in many sustainability initiatives broadly—are reflected in and compounded by the barriers between farmers and the adoption of FMIS and digital tools. Primary research featured in this report and previous Trust In Food publications (such as [Farmer Perspectives on Data 2021](#)) shows several troubling indicators for the digital infrastructure required to participate in most, if not all, carbon market opportunities.

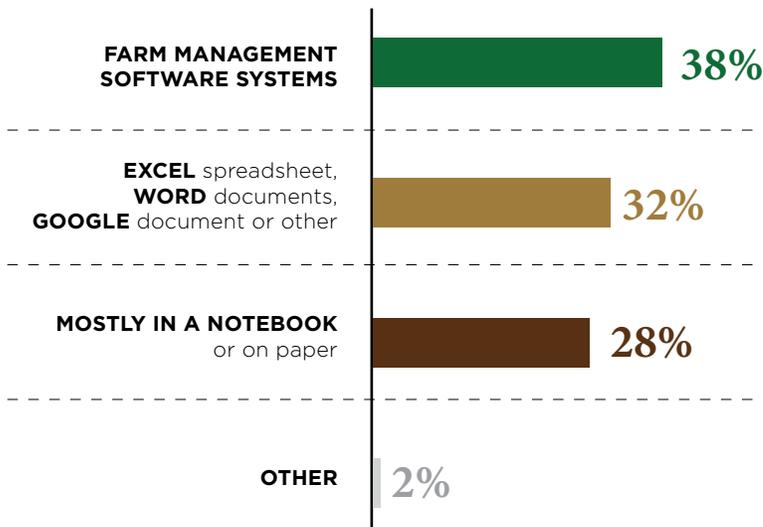
DATA AND ANALYSIS

Roadblock #4

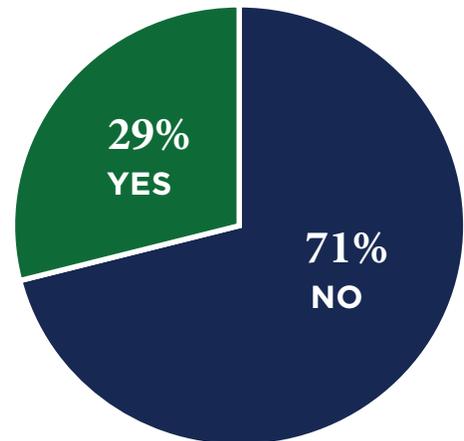


When farmers keep records of their sustainability practices, 62% or more are unlikely to use farm management software systems.

What is the primary way you store and
MANAGE YOUR OPERATION'S DATA related
 to production and management practices?



In 2020, did your operation utilize or participate in any **SOFTWARE-BASED SUSTAINABILITY/CONSERVATION TOOLS**?



Analysis

According to the previously referenced Perspectives on Data, 62% of farmers surveyed are not fully digitally integrated for the purpose of managing farm information. Almost one-third primarily use pen and paper. Furthermore, over 70% do not use software-based sustainability or conservation tools. Cited pain points have included the need to streamline administrative paperwork, integrate sustainability solutions into existing on-farm software and provide technical support.

62% of farmers surveyed are not fully digitally integrated for the purpose of managing farm information.

However, historical low adoption rates of digital tools and high rates of concern for data ownership/access and privacy tell a more complete story: Even outside of carbon markets, farmers do not trust digital record-keeping tools will provide benefits that justify the time, cost and learning curve required for their use. A separate but synergistic distrust of carbon marketplaces as motivators to step over that bar is only likely to raise it.

For carbon markets or any other data-driven incentive programs, the low digital fluency of farm operations overall represents a missed opportunity for farmers to get credit for their environmental stewardship. For example,



Perspectives on Data found that the vast majority of row-crop farmers report using at least some conservation ag practices. Still, it is likely that many do not have the tools to either analyze the financial benefits these decisions accrue or to provide data for programs that would grant greater rewards. Other research suggests specialty crop farmers have even less capacity to demonstrate their stewardship with data.

Roadblock #5



Fear of regulation (69%), privacy concerns (69%), and unavailable experts (48%) make data collection a challenging step for many farmers.



Analysis

Farmers report that two primary barriers limit their adoption of FMIS: mistrust of organizations collecting data and a lack of understanding of these technologies. Yet there are other major obstacles. For example, only 52% of respondents to Perspectives on Data reported having a trusted adviser who can answer questions about FMIS and digital ag. This gap between



understanding and adviser access represents a substantial market opportunity for qualified experts to become trusted resources and help farmers integrate data and digital ag further into their operations.

Evidence suggests that moving into a position of trust or partnering with organizations that farmers already consider trusted experts could pay dividends for carbon market providers. Farmers who reported having a trusted digital ag adviser were 24% more likely to use FMIS than those who did not. Similarly, farmers who primarily market their harvest to food or fuel companies (i.e., organizations that have already successfully passed their trust thresholds for providing value in exchange for their extra effort) were 10% to 28% more likely to use FMIS when compared to respondents who did not.

In the same Perspectives on Data report, 79% of farmers noted they would be more likely to start or increase their use of precision tech if they could do so at no charge. This statistic may indicate that offering free tracking tools could foster goodwill among potential carbon market participants, assuming marketplaces can also limit farmers' time investment and learning curve for enrollment and participation.

Roadblock #6



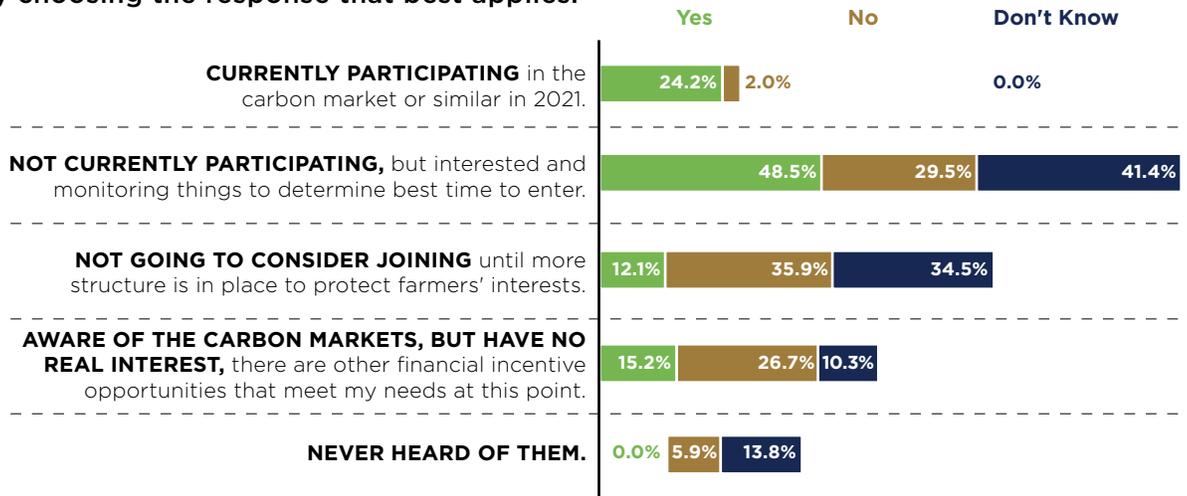
Only 6% of farmers are tracking soil carbon sequestration across their operations, including just 24% of those participating in carbon markets.

Do you **CALCULATE SOIL CARBON SEQUESTRATION** across your enterprise?



DO YOU CALCULATE SOIL CARBON SEQUESTRATION ACROSS YOUR ENTERPRISE?

Please describe your operation's relationship with carbon markets and related programs by choosing the response that best applies.



Analysis

The figures above should punctuate the key message of this section: Even given compelling incentives or usable tools to collect data, producers will not necessarily act to adopt them. Instead, change will likely also require Human Dimensions support, such as a confident trust relationship with a tool provider or recommending adviser. Given low participation in agricultural carbon markets, a 6% rate of soil carbon sequestration tracking operation-wide is unsurprising. However, it adds context and an even greater level of concern to a troubling [The State of Sustainable Ag 2022](#) finding:

- ▶ A plurality of farmers (47%) considers “operation-wide profitability” the “most important indicator of their operation’s overall annual performance.”
- ▶ Despite this, over the past five years, 59% of farmers did not calculate whether their regenerative practices had yielded economic benefits.

This additional insight on carbon tracking may imply that even in cases where farmers are already measuring carbon sequestration on a field-by-field basis >



for the purposes of their programs, existing barriers to farm data collection continue to separate this sustainability metric from consideration as a broader component of current or future operational success.

Defining soil-carbon sequestration and related returns is often anything but clear-cut. The methodology for validating the carbon-holding capacity of soils or the results of sequestration practices may seem unconvincing: Measurements have not been standardized and [can vary dramatically](#) across geographies and climates, among certifying bodies, or both. Furthermore, the methodology for these measurements typically poses the same or greater difficulty for farmer usability and access as other sustainability data collection tools.

The influence the research ascribes to producers' consistent mistrust for government or private treatment of their collected data is also worth noting. In keeping with focus group findings from [Scaling Connected Ag 2021](#), a white paper organized between Trust In Food and partners of America's Conservation Ag Movement, some farmers report suspicions that keeping accessible records of carbon or other data may open doors best kept closed: To future regulatory action, further barriers to competition in the marketplace, or even the sacrifice of a valuable commodity they might need to repurchase in the future (at higher prices) to insulate against enforcement action towards carbon neutrality on their operations.

The gap in carbon and other sustainability data tracking shouldn't be interpreted as a lack of producer concern for conservation issues. On the contrary, a growing body of [public](#) and [private](#) research confirms that rural Americans have a high level of interest in sustainable operations. These values have remained concerningly disconnected from both farmer understanding of the value of carbon in the soil and farmer motivation to implement enterprise-level record-keeping that might better demonstrate the financial and operational benefits of changing practices.



Lack of producer motivation to track the benefits of sustainability practices across all their acres will lead to farmers failing to receive their maximum eligible incentives. Inevitably, this will also result in the failure of those providing said incentives (including opportunities such as carbon markets) to achieve scale in their programs. Makers of carbon markets and related tools must tailor their products and customer support, addressing social and cultural dynamics to quickly move farmers towards “Yes, I am interested and confident in this opportunity.”

BRIDGING THE GAPS



Emphasize what farmers value.

To help producers understand the value proposition, marketing efforts should move away from silver-bullet incentives, provide a package of offerings and clarify the benefits of digital tool adoption—and the value of their existing best practices. Marketplace providers should explore different framings, such as highlighting the relationship between working lands, best management practices, carbon sequestration and enterprise-level finances. Combined with robust farmer feedback programs, this may help more farmers see that measuring carbon can align with stewardship and profitability.



Recruit old and new trusted partners.

Although more research is needed to draw definitive conclusions, it may be that service providers and organizations that already have business relationships with farmers can play a critical role in digital adoption, including tools farmers will use to participate in carbon and sustainability programs. “Trusted advisers” are likely to differ for each cohort of engaged producers and could include peers, ag retail partners, university Extension agents or more.

Makers of carbon markets and related tools must tailor their products ... to quickly move farmers towards, “Yes, I am interested and confident in this opportunity.”





Scale up new players.

Operations most willing to use digital tools might face unique barriers to adoption. They might be young or beginning farmers and lack the professional network, financial resources or access to land on which to implement new practices. Carbon marketplaces should explore outreach and resources for the next generation, aligned with their values, to engage this rapidly growing and influential cohort.



Make carbon tracking seamless, all-inclusive—or even free.

Every effort should be made to automate data input requirements, reduce costs and incorporate associated metrics such as soil health, water quality and biodiversity. This holistic approach could enable companies to pursue pay-for-performance contract arrangements that offer a premium or an incentive because of the co-benefits of their management practices on the farm. These could include activities that improve soil health, water quality or wildlife habitat. Offering tracking tools for free could be an essential trust-building first step.





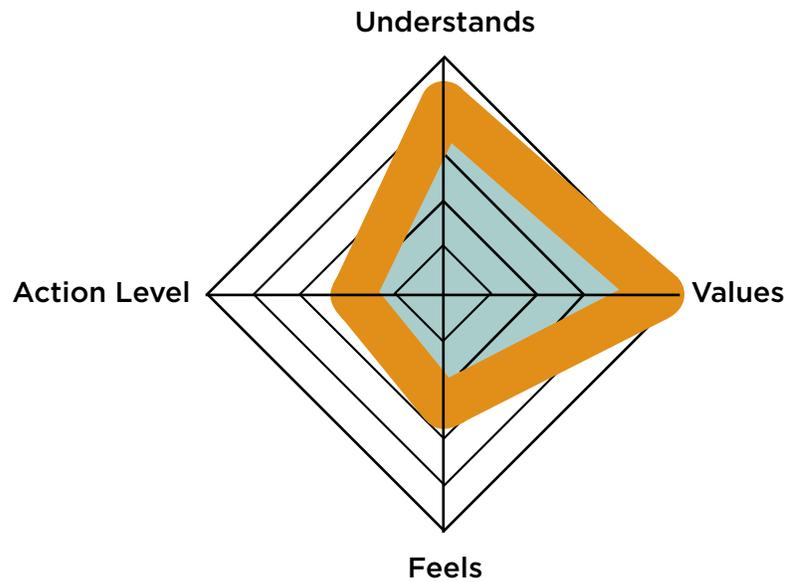
CARBON DATA: **FINDING AN AFFINITY**

The insights explored elsewhere in this report lead Trust In Food to forecast that the road to accelerated adoption of agricultural carbon and ecosystem service markets might be longer and more winding than some have anticipated. If today's carbon market offerings have not yet connected with participants' deeper goals, objectives and concerns, then smoother travel and arrival at the desired destination require a better and more nuanced understanding of the ones who must make the change journey: America's farmers and ranchers.

The good news is that while farmer motivations are complex, further understanding is both eminently possible and attainable. The following examples demonstrate several ways to approach answering critical questions, equipping carbon market providers with tools that enable segmented, customized programs and program delivery that reach the core drivers of farmer decision-making. These questions include those who Trust In Food pursues as part of our Human Dimensions of Change Insights work:

- ▶ **Does a producer understand how the program relates and is relevant to their operation?**
- ▶ **Does a producer see the value—by their definition—in the carbon market program?**
- ▶ **Does the program align with a producer's personal and community values?**
- ▶ **Does the program adequately address barriers—perceived or real—that a producer must overcome?**
- ▶ **Does the producer possess—and feel confident they possess—the technical, financial and community support they need to take the next step?**





Trust In Food is also developing a custom carbon insights platform for market providers and more, providing in-depth intelligence on:

- ▶ Producer sentiment about carbon and other ecosystem markets;
- ▶ Differentiating factors farmers evaluate when choosing a program;
- ▶ Co-affinities (e.g. behaviors or beliefs that tend to occur together) for positive or negative carbon attitudes;
- ▶ Practice adoption triggers; and
- ▶ Information on producers' perceived barriers to market participation.

Although these and other Human Dimensions of Change Insights are most useful when tailored to a specific program or service offering, some examples of broad insights are captured in the pages that follow.

DATA AND ANALYSIS

Path Forward #1



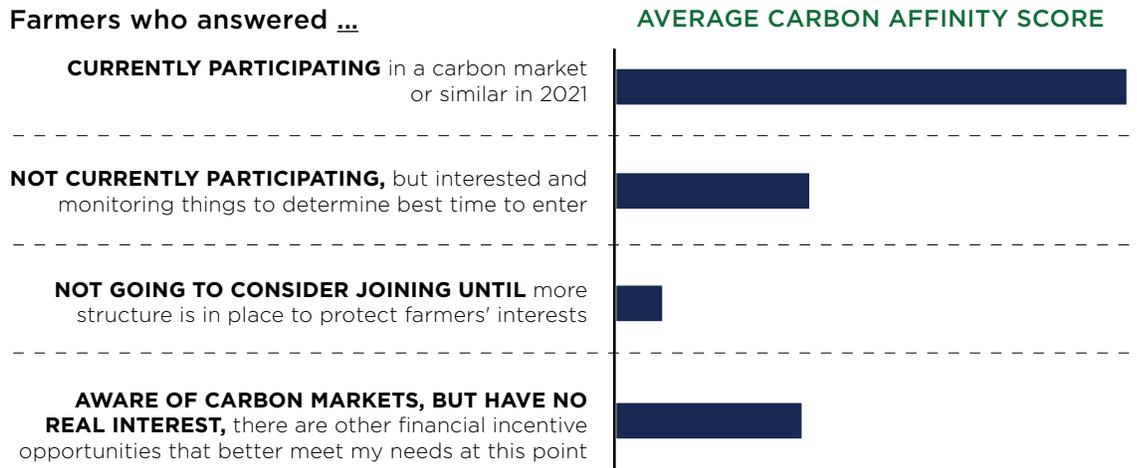
Understand that readiness levels vary from producer to producer.

Farm Journal's "Carbon Affinity" scoring measures the Farm Journal audience's engagement with carbon-related content and resources. It serves as a predictive tool for identifying which producers are likely to seek information about, and engage with, educational and promotional material about carbon markets and related practices.



To provide insights into the relationship between media behavior and farmer decision-making, Carbon Affinity scores can be used to examine other Farm Journal data sources in various ways and at various scales: for example, those farmers who responded to the survey question shown previously in Roadblock #1.

PLEASE DESCRIBE YOUR OPERATION'S RELATIONSHIP WITH CARBON MARKETS AND RELATED PROGRAMS.



Analysis

The key insight of the figure above is a somewhat intuitive, but critical, commentary on the relationship between content affinity and willingness to join a related program: Those farmers who were part of a marketplace as of 2021 have a Carbon Affinity score nearly 20% higher than those who are still monitoring for the best time to enter. This definitive relationship speaks to the greater collective willingness of higher Carbon Affinity farmers to seek out updates and information on programs in which they become participants.

The utility of Carbon Affinity—or any tool to understand how producers interact with content that is, in this case, related to carbon and carbon markets—draws on well-studied behavioral science and data-driven marketing concepts. Because we know that people search for and consume information in their decision-making process, we also understand that those likelier to

review said information are further along in their decision-making journey than those who are not. These documented decision pathways are largely consistent across groups, whether the decision in question is making a significant new purchase or trying a once-in-a-lifetime experience.

An even more interesting interplay between carbon market attitudes and the likelihood to engage with carbon-related content is demonstrated by the Carbon Affinity scores of those farmers who do not currently participate in any marketplace. While only slight differences in willingness to pursue carbon-related media emerged between farmers who are tentatively interested, uninterested largely due to preoccupation with other incentives or unaware of market opportunities, the Carbon Affinity gap between current carbon market participants and those producers who requested “protection” for farmer interests was closer to 30%. These findings suggest that this group of farmers (34% of total respondents) feels strongly enough about carbon marketplaces’ implied “threat” to discourage them from trying to learn more.

A core goal of applied content affinity analysis is using other data sources to either learn to target similar groups with messages tailored to avoid those pitfalls—or to seek out and target other producers entirely.

Path Forward #2



Identify key demographic, operational and attitudinal differences between high Carbon Affinity farmers and other farmer cohorts.

In our work with clients, we take this idea of predicting readiness several steps further, combining Carbon Affinity with other behavioral and psychographic data based on specific client program design.

Here, we analyzed the top quartile of high Carbon Affinity producers against the rest of the Farm Journal data ecosystem to create a complete snapshot of a selected cohort.



High Carbon Affinity producer snapshot



≥75% Carbon Affinity

Among 150+ acre row-crop growers in the contiguous United States compared to the average farmer



Operation Size
 48.6% larger



Operation Income
 32.5% higher



Age
 2.2% younger



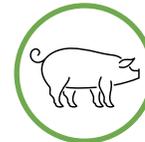
Corn
 51.2% more acres



Beef
 14.4% more likely



Dairy
 5.2% more likely



Hogs
 7.1% more likely



Horses
 7.2% more likely

Interests

The highest-magnitude difference between their psychographic snapshot and that of an average farmer is their 20-35% increase in some interests related to fishing, off-roading, scenic travel, boating, hunting or horses.

Channels

They are more likely than the average U.S. citizen to engage with the radio or outdoor advertising, and less likely to engage with magazines, newspapers, televisions or the Internet.

Selected Details

7.3% more likely to participate in local politics
 2.9% more likely to be "green advocates"
 3.3% more likely to take financial risks
 8.7% more likely to see their work as a career
 8.5% more likely to exploit new technology

Analysis

Notably, we found that compared to the average U.S. farmer, growers with over 150 acres of row crops with higher Carbon Affinity scores are more likely to:

- ▶ Be younger;
- ▶ Show more interest in fishing, hunting, off-roading and other outdoor activities; and
- ▶ Own larger, higher-income, more diversified operations.

Other selected details for the higher Carbon Affinity segments of specific producer cohorts, such as "this group of farmers is 8.7% more likely to see their work as a career" or "this group of farmers is 3.3% more likely to take financial risks," can be used to fine-tune messaging that might best resonate with the farmers most likely to take action. Years of consumer marketing research shows that campaigns aligned with the language, interest and behavior profiles of intended targets have a greater chance of success.



This approach represents one of the focuses of Trust In Food's data work: Our Human Dimensions of Change Insights, a potential answer to the Golden Triangle for Accelerating On-Farm Climate Impact's need for Human Dimensions support. This level of analysis draws on some of the same techniques as sophisticated consumer and tech companies to incorporate cultural, psychological and social considerations to the traditional agronomic and economic factors that shape our understanding of each producer's decision-making journey.

Questions we ask during our work on data-driven Human Dimensions include:

- ▶ **What information could help a producer see this change in a relevant and resonant way?**
- ▶ **Might producers identify and emotionally connect to the value of this change because it meets a deep-seated need or wants?**
- ▶ **Who do producers trust for information and decision-making?**
- ▶ **What does the community and local culture surrounding producers think and do?**
- ▶ **Do producers feel confident in making a decision about this change opportunity and their ability to implement it?**
- ▶ **What triggers could spur producers to move from consideration to action?**
- ▶ **What format and delivery mechanisms would be most trustworthy and impactful?**

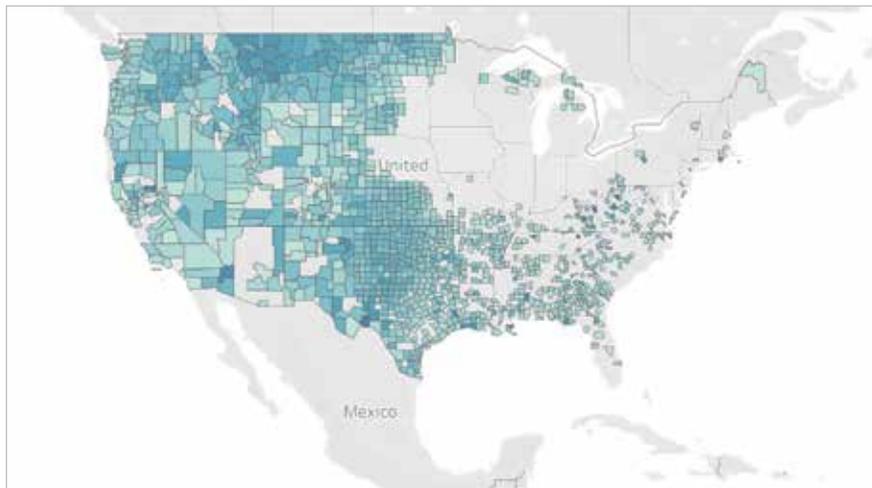


Path Forward #3



Find and target the locations where producers already feel ready for carbon market opportunities.

Map of the continental U.S. based on a Carbon Affinity score of $\geq 50\%$ (county-level averages for an audience of 150+ acre row crop farmers)



Farmers and ranchers with over 150 acres of row crops in these geographies have a higher interest and affinity for information about carbon and ecosystem markets, suggesting potential readiness to consider program or practice enrollment. Darker blue counties indicate areas of greater producer interest.

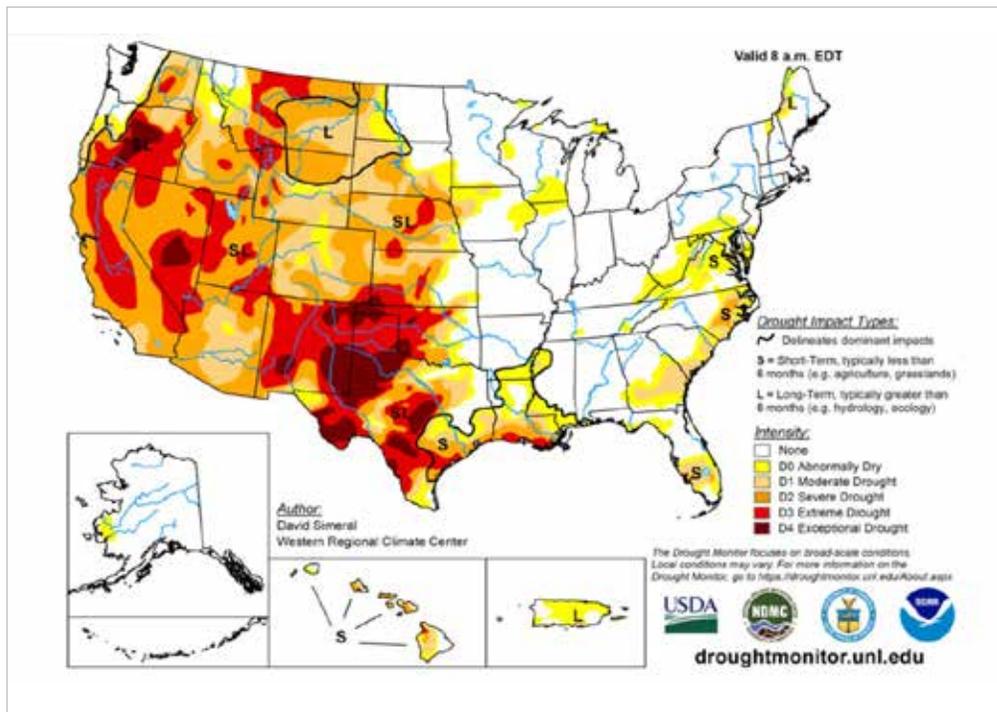
Analysis

The Carbon Affinity map above suggests that among row-crop farmers with over 150 acres, higher Carbon Affinity scores appear more broadly in the western U.S. In comparison, lower scores are concentrated throughout the Corn Belt and adjacent regions. This information can guide outreach and activation strategy for carbon and ecosystem service providers, which will likely gravitate toward geographies of high agricultural production to maximize their investment.



Such trends may also be worth noting for the pursuit of other relationships between place and producer carbon sentiment. For example, geophysical realities such as climate conditions or soil carbon sequestration capacity might contribute to producer readiness to act; they may also prove foundational to an alternative outreach strategy that maximizes both farmer interest and potential tons of carbon in the soil.

U.S. DROUGHT CONDITIONS



At a minimum, knowing that carbon interest and readiness vary widely from place to place provides key intelligence for market development strategies. Geography matters—precision targeting of scarce resources in those places where producers have already shown interest in carbon market opportunities may increase chances of early success.



CULTIVATING CARBON INSIGHTS



Carbon Affinity is just the beginning.

Carbon Affinity scoring and analysis of the groups this approach identifies is just one example of how strategic segmentation among different farmer groups can help predict future behavior. It can also provide targeted delivery of the most relevant and meaningful messages for each farmer audience, backed by data on farmer media behavior. Such insights are used extensively in modern consumer marketing, yet their potential for accelerating climate-smart agriculture has only begun to be unlocked.

Trust In Food is one source for tools that organizations can put to work and help farmers and ranchers scale climate-smart agriculture in the way that's right for them; delivered with the care, empathy and actionable insights that farmers deserve—and may demand—before considering participation in new practices and programs.

To find out more about Trust In Food's carbon insights platform, Human Dimensions of Change Insights and other offerings, visit our website at www.trustinfood.com.



APPENDIX:

METHODOLOGY IN REVIEW

The findings in this report are based on data from several previously published Trust In Food and Farm Journal research studies. Notes on the provenance of each data source are below.

CARBON MARKETS: CHOOSING TO PARTICIPATE

Source material for the data included in this section can be found in [The State of Sustainable Ag: Producer Perspectives on Pathways and Barriers to Change 2022](#), a joint project of Trust In Food and Field to Market. Notes on methodology and demographics can be found at the end of the report.

CARBON RECORD: DIGITAL TOOL USE

Some of the data included in this section originated in [The State of Sustainable Ag: Producer Perspectives on Pathways and Barriers to Change 2022](#), a joint project of Trust In Food and Field to Market. Notes on methodology and demographics can be found at the end of the report.

Some of the data included in this section originated in the [Farmer Perspectives on Data 2021](#), a joint project of Trust In Food and The Sustainability Consortium. Notes on methodology and demographics can be found at the beginning and end of the report.

CARBON DATA: FINDING AN AFFINITY

Some of the data included in this section originated in [The State of Sustainable Ag: Producer Perspectives on Pathways and Barriers to Change 2022](#), a joint project of Trust In Food and Field to Market. Notes on methodology and demographics can be found at the end of the report.

Some of the data included in this section originated in [Farmer Perspectives on Data 2021](#), a joint project of Trust In Food and The Sustainability Consortium. Notes on methodology and demographics can be found at the beginning and end of the report.

Farm Journal's "Carbon Affinity" is an analytic tool that draws on Farm Journal's total database to forecast the affinity of its audience for carbon-related topics and interest areas.

Other Works Cited

- [Ag Economy Barometer \(April 2021\)](#), Purdue University Center for Commercial Agriculture
- [Ag Economy Barometer \(September 2021\)](#), Purdue University Center for Commercial Agriculture
- [Financial Innovations to Accelerate Sustainable Agriculture: Blueprints for the Value Chain 2022](#), Field to Market
- [How to Grow and Sell Carbon Credits in US Agriculture](#), Iowa State University Extension and Outreach, Ag Decision Maker
- [Understanding Rural Attitudes Toward the Environment and Conservation in America](#), Duke University Nicholas Institute for Environmental Policy Solutions



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