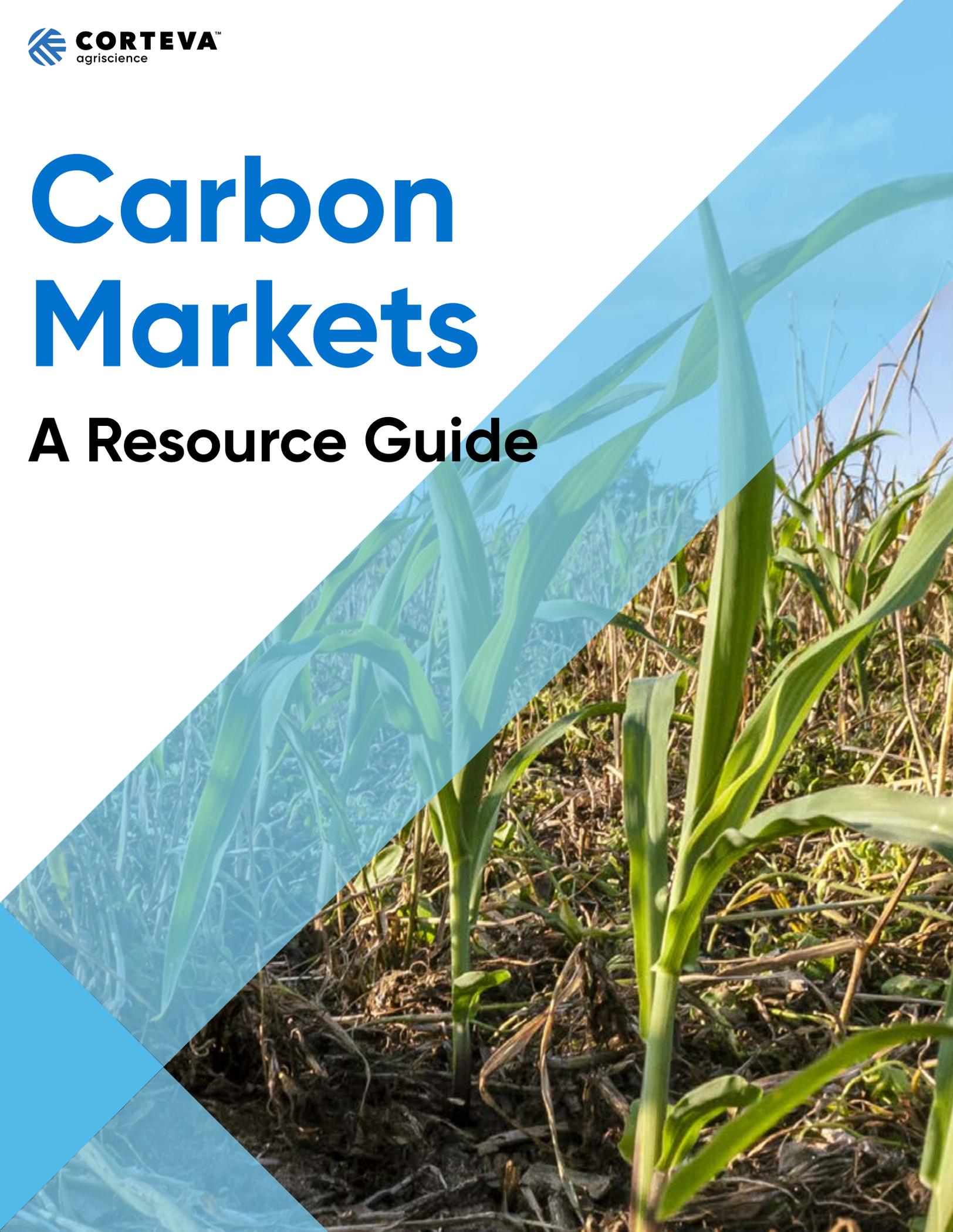


Carbon Markets

A Resource Guide





Carbon Resource Guide

Carbon may have the spotlight, but many farmers still have questions about this new revenue stream and what it means for their farms. According to a 2021 Corteva Agriscience™ [survey](#) of 600+ row crop farmers, 72% said they've heard about carbon programs but don't know much about them. And while 20% are actively evaluating these programs, only 3% are currently enrolled.

The good news is that 66% of those surveyed have already implemented soil health practices such as using cover crops and/or reduced tillage that would qualify them to enroll in most carbon programs.

This guide was created to answer farmers' most pressing questions about carbon. It explores what a carbon program is, how these programs work and, most importantly, the questions to ask as you evaluate a carbon contract.

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What's Driving Interest in Carbon?

Companies are under pressure from consumers, investors and employees to reduce their carbon footprint. By 2020, [80% of companies](#)¹ worldwide committed to reducing greenhouse gases, and [20% of the largest public companies](#) made net zero commitments²—recognizing that the long-term health of their businesses depends on global emission reductions.



As weather patterns become more extreme and erratic, we're seeing the impact it's having on food, shelter, marginalized communities, and our ecosystem. That's why we worked to make Fat Tire the first certified carbon neutral beer in the U.S. and are committed to being carbon neutral by 2030.

—New Belgium Brewing



Pepsi is required (whether by consumers, NGOs or Walmart) to have carbon goals—but we can't just do the bare minimum. Without farmers producing really good corn, we can't sell the DORITOS and CHEETOS that consumers love. For us to be successful, farmers have to be successful.

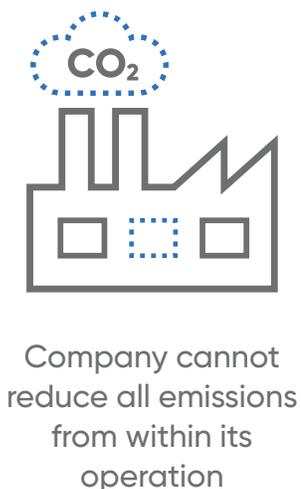
A circular inset image showing a field of green corn plants.

**—Margaret Henry,
Director of Sustainable
Agriculture, PepsiCo**

Why Do Carbon Markets Exist?

To reduce its carbon footprint, a company will cut emissions internally. For example, a corporation like Amazon™ might cut transportation steps in its supply chain or adopt clean energy at a distribution center.

If that's not enough, the company can "offset" its emissions (i.e., pay for the pollution it can't reduce). One of the easiest ways to offset emissions is to buy carbon credits through a carbon program or market.



+



Company offsets excess emissions by buying carbon credits

=



**NET-ZERO
EMISSION**

Company can validate net-zero emissions

What's an Agricultural Carbon Program?

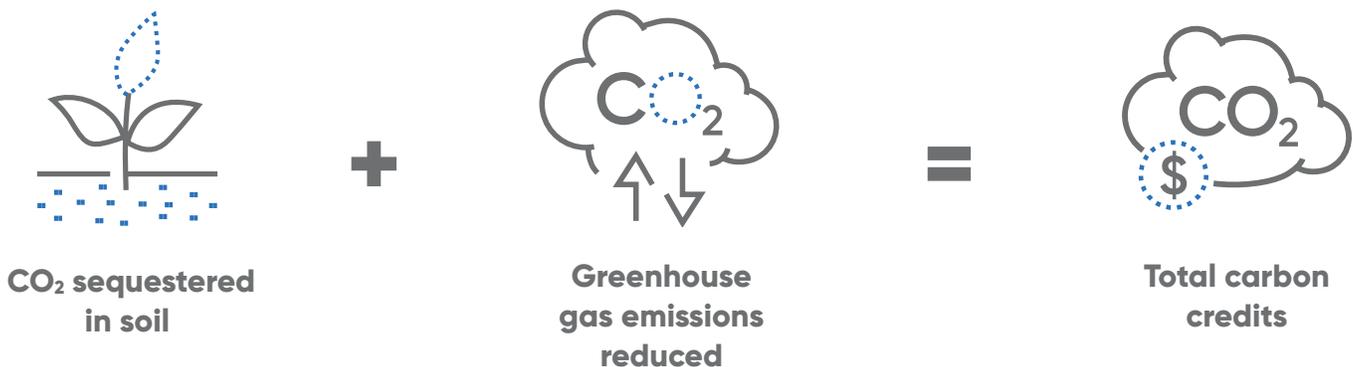
Agricultural carbon programs give farmers the opportunity to make money for the carbon they sequester and the emissions they prevent by selling carbon credits to buyers who want to offset their carbon footprint.

[Science shows](#)³ that agriculture can capture or reduce greenhouse gas (CO₂) emissions by adopting soil health practices such as reduced tillage, cover crops or more efficient nitrogen management.

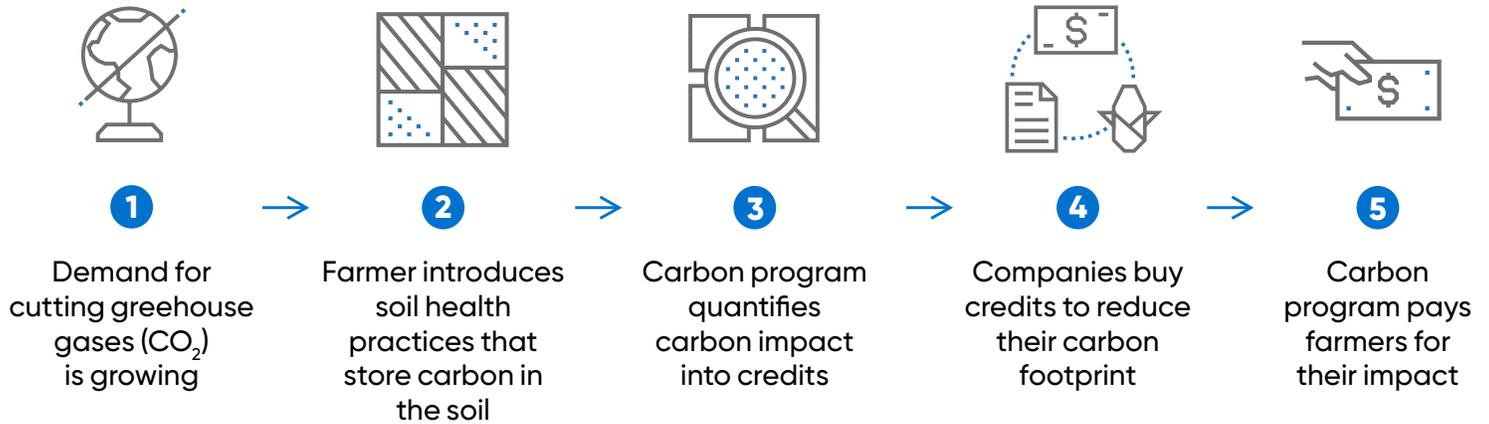
By introducing soil health practices, a farmer can:

1. "Sequester" or capture CO₂ from the atmosphere into the soil
2. Avoid greenhouse gas emissions

For every 1 metric ton of carbon sequestration or emissions reductions, a farmer earns 1 carbon credit. Your carbon sequestration, or carbon yield, is measured by the practices you choose and data-driven models that predict soil carbon based on soil type and sampling, and weather data.



How Does a Carbon Program Work?



Estimate Your Carbon Payment

Want a quick estimate of what you could earn through Corteva's Carbon Initiative? Check out our [Carbon Payment Calculator](#).

A carbon program can be the lever you need to adopt soil health practices—providing extra revenue to alleviate risks that come with new practice changes.



Demand for Carbon Credits Is Growing

While carbon programs may be new to agriculture, the demand for carbon credits is rising. Farmers will only see the upside in terms of market demand and carbon credit pricing.

UP 100X

Carbon credit demand up 100x by 2050⁴

\$50 BILLION

Overall carbon market worth \$50 billion by 2030

1 IN 5

20% of world's largest companies are committed to zero emissions²

UP 60%

Carbon credit value up 60% from 2020⁵

Does a Carbon Program Make Sense for Me?

To be eligible for a carbon program, you have to introduce new soil health practices. Before you sign up, ask yourself three important questions:

1. What's my agronomic goal?

Farmers are in the business of growing crops, not carbon. If you're committed to improving soil health through new practices and reaping the long-term financial and agronomic benefits, then a carbon program will make sense for you.



Why?

- As with any practice change, introducing soil health practices can require trial and error
- Soil health practices require a longer-term commitment to reap the benefits and have an impact
- Payments from a carbon program will offset some, not all, of the costs associated with new practice changes

More Carbon = Better Soil

Turns out carbon is critical to the physical, chemical and biological health of your soil.

Boosts aggregate stability and improves water infiltration

Reduces runoff and surface crusting

Adds and holds onto nutrients

Feeds and enhances microbial diversity

Click [here](#) to learn more about the agronomic rewards and ROI of soil health.

2. Can I introduce one or more of these eligible practices on my farm?



Introduce cover crops

and/or



Reduce tillage

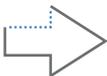
and/or



Increase nitrogen efficiency

3. Are these new practices?

Eligible practice(s) must be introduced within the prior crop season to satisfy “additionality” requirements.

<p>Are these new practices?</p>		<p>Carbon credits must reflect “net-new” carbon sequestered or emissions prevented through new practice changes—beyond what was happening in that field before the new practice.</p>
<p>Why does additionality matter?</p>		<p>Buyers are under pressure to make a meaningful impact and must ensure their dollars are going towards new or additional carbon sequestered.</p>

What if you introduced these practices years ago?

You still have options.

To be eligible for a carbon program, you can:

- Implement eligible practices on new acres
- Add another practice to existing acres (for example, introduce cover crops on fields where you’re already using no-till)
- Diversify your crop mix

What to Look for in a Carbon Program

Before you sign up for any carbon program, make sure to fully understand three important things.

1. Am I getting top dollar?

What to Ask	Why?
Are my carbon credits independently certified?	Having carbon credits certified by an independent third-party confirms that your credits meet the strict standards that buyers want and are willing to pay premium prices for.
Who is buying my credits?	It's important to ensure that the program has guaranteed buyers lined up.
Am I guaranteed a minimum payment for my carbon credit?	Knowing the minimum credit price helps you determine if the program is worth the investment in new practices.

2. What am I committing to?

What to Ask	Why?
Can I make agronomic changes if necessary without penalty?	Farming comes first and you need the flexibility to make agronomic changes based on your cash crop needs.
Can I opt out of the program without penalty?	Stuff happens. If you can no longer resume practices, you will need the option to exit the program without paying money back or a penalty.
Am I locked into a set price for my carbon credits?	Carbon markets are growing and credit prices are rising. You want a program that lets you benefit from market upside.

3. Is it worth my time?

What to Ask	Why?
Will I get agronomic support?	You'll need advice and agronomic expertise to successfully introduce new practices.
What are the data requirements?	Understand the time and effort that's required to record your practices plus the cost and ease of use of the software.
Is my data protected?	Review the program's commitment to data privacy and protection.

Explore Your Options

	Corteva	Bayer	Truterra (TruCarbon)	Cargill (RegenConnect)	FBN (Gradable)
Certified Credits	Yes	Unknown	Yes	Yes	Unknown
Buyers	+10 major corporate buyers	None	Microsoft	Securing buyers for 2022	None
Payment	Up to \$30/credit	Up to \$9/acre	\$20/credit	\$20/credit	\$14/credit
Contract	5 years	10 years	20 years	1 year	5 years
How Is Data Collected?	Granular Insights (free software)	Climate Fieldview	Truterra Insights Engine	RegenConnect	Gradable

Other Important Questions to Ask About Carbon

Q. Why is an ag company like Corteva offering a carbon program?

A carbon program can help farmers build better soil, reduce greenhouse gases—and help them make more money along the way. How?

- Building soil carbon leads to more resilient crops and improves soil health
- Agricultural carbon programs are one of the most beneficial and cost-effective ways to reduce greenhouse gas emissions
- Farmers can use income from carbon programs to offset investments in new practices

Q. Why should I join a carbon program now?

Currently, carbon programs only pay for carbon sequestered from new practice changes. That's what buyers want and are willing to pay premium prices for. Any fields where these practices have already been implemented won't be eligible. If you're considering soil health practices, now is the time to sign up for a carbon program so you don't risk eligibility later.

Q. What's stopping a farmer from going direct to a buyer?

Nothing—other than the time, effort, and science needed to generate and sell a carbon credit. To get paid for carbon credits, farmers must measure their carbon sequestration rates field by field, certify their credits with regulatory bodies, and then negotiate credit prices with individual companies.

Q. What happens to carbon programs when the government starts mandating practices?

Congress has demonstrated its support of private carbon markets (as shown by the [Growing Climate Solutions Act of 2021](#)⁶), and farmer participation in private carbon programs should not affect eligibility for any government program (as is currently the case with government subsidies and cost-sharing programs like EQIP).

Q. How does this work if I'm leasing land? Who gets the payment?

Carbon programs are marketed directly to the individual who is farming the land (i.e., choosing the practice[s]). The farmer—not the landowner—signs the contract and payments go to the contract holder. Depending on the program, you may or may not need signatory permission from the landowner to enroll.

Q. Introducing new practices is challenging. How do I know this is the right agronomic decision?

Set a clear objective, start small and tap into your advisors for counsel—it's the same advice for any new practice you introduce on your farm. For a quick overview of the benefits of these soil health practices beyond just a carbon payment, check out our [Soil Health Resource Guide](#).

Q. What's it going to cost me?

Any new practice comes with costs. The trick is to see the big picture. For example, costs saved from reducing tillage passes, reduced erosion, and increased organic matter can all help offset investments in new equipment. Likewise, extra revenue from a carbon program can alleviate some of the risks behind new practice changes.

Q. How do carbon programs measure carbon credits?

Carbon programs rely on multiple factors to determine the amount of carbon in soil:

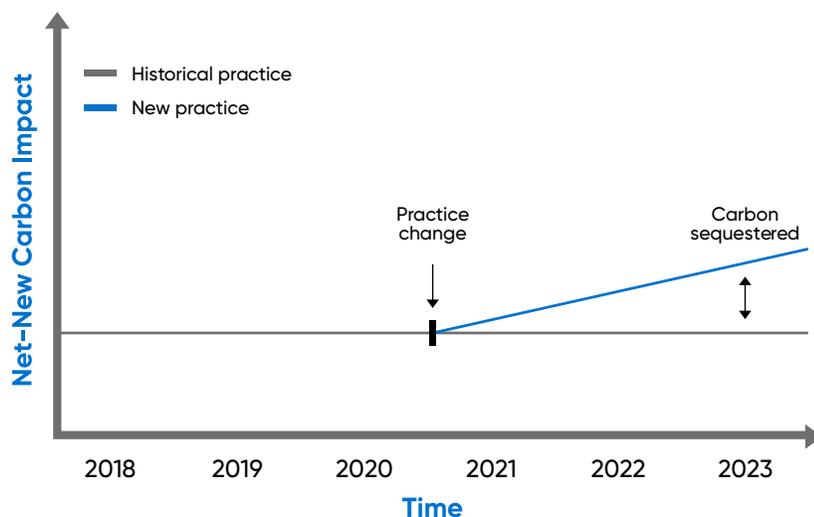
- New and historical management practices
- Soil sampling
- Soil type and weather data

Most carbon programs rely on data-driven models to predict soil carbon outcomes across fields. These models simulate how crops grow—factoring in soil condition and type, plant growth and soil disturbance—to predict soil carbon. There are baseline scenarios for both historical practices and soil health practices. Because it's not cost effective to sample soils across all enrolled fields, randomized soil samples are often used to validate the models.

Measurement Approach

1. **Establish starting carbon levels** through randomized soil samples
2. **Model changes** from conducting new practices vs. historical practices
3. **Calculate the difference** to determine impact
4. **Verify practices** have taken place

Model



Appendix

¹ Richard Threlfall, Adrian King, Jennifer Shulman and Wim Bartels. "[The Time Has Come](#)," The KPMG Survey of Sustainability Reporting 2020, KPMG Impact, December 2020.

² Black, R., Cullen, K., Fay, B., Hale, T., Lang, J., Mahmood, S., Smith, S.M. (2021). "[Taking Stock: A global assessment of net zero targets](#)," Energy & Climate Intelligence Unit and Oxford Net Zero, March 2021.

³ Robert J. Zomer, Deborah A. Bossio, Rolf Sommer and Louis V. Verchot. "[Global Sequestration Potential of Increased Organic Carbon in Cropland Soils](#)," Scientific Reports, nature.com, November 14, 2017.

⁴ Christopher Blaufelder, Cindy Levy, Peter Mannion, and Dickon Pinner. "[A blueprint for scaling voluntary carbon markets to meet the climate challenge](#)," McKinsey Sustainability, January 29, 2021.

⁵ Stephen Donofrio, Patrick Maguire, Kim Myers, Christopher Daley, and Katherine Lin. "[State of the Voluntary Carbon Markets 2021](#)," Ecosystem Marketplace, September 15, 2021.

⁶ 117th Congress, S.1251: [Growing Climate Solutions Act of 2021](#), Passed Senate June 24, 2021.

