

# AEI PREMIUM

Corn Saves America

Episode 1 – Are Carbon Markets the New Ethanol?

**Sarah Mock**: In American agriculture in 2021, carbon is “The Next Big Thing.” It seems like absolutely everyone, from lawmakers, to Silicon Valley technologists, [to the Farm Bureau](#) are talking about how they might be able to help farmers turn this one little molecule into cash.

It’s all about sequestration, of course, or trapping atmospheric carbon in agricultural soils, and importantly, proving it. Specifically, to companies or individuals looking to balance the books on their own carbon emissions, by paying farmers to store some extra.

A growing handful of companies are already racing to set up marketplaces where farmers can have their carbon sequestration efforts certified and their credits sold, creating, as one California rancher told MSNBC something that’s “Good for the environment and good for our pocketbooks.”

What exactly is a carbon credit? And how is it created? Those are key questions at the moment, and there is not general agreement on the answer. But in general, a farmer creates a carbon offset when they utilize any of an incredibly wide range of practices, from cover cropping to conservation tillage to planting perennials and integrating livestock.

But despite the unanswered questions around ag carbon, farmers are getting involved - taking meetings, scanning websites and lengthy user agreements, and tracking news clips, congressional hearings, and USDA announcements, hoping to figure out how to turn even basic practices into new revenue streams.

According to a recent Farm Progress poll, only about 3% of farmers are actively participating in a carbon market, but another 75% or so say they’re keeping an eye on how these programs evolve and as growers kick the tires and lean in for a closer look, a key issue – if not the key issue - is how much carbon sequestration actually pays. A straightforward question on its face, there’s a deeper question there that is really important – namely - is it really possible for conventional commodity crops, say corn and soybeans, which are grown on the vast majority of America’s agricultural acres, to, with a few small adjustments, make farms a major part of mitigating climate change? And if so, how much will companies, governments, and individuals pay to turn America’s farms into carbon sponges? Can corn save America - and maybe the world - from the perils of climate change?

That’s the question that brings us here - on this journey to understanding agriculture’s solutions to environmental problems. I’m Sarah Mock, freelance agriculture writer and research and erstwhile wrangler of those kinds of questions here at AEI Presents. I’ll be here with you, sifting

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through the noise to find insight from ag's economic past that can help us prepare for an uncertain future.

Joining me are ag economists David Widmar and Brent Gloy, who have been asking themselves a version of this, "Can corn save America" question for a while now. While individual producers are wondering whether or not to participate in these carbon markets, how much paperwork it takes to sign up, and how long the commitment is - Brent and David wonder after the other end of the timeline. If farmers do sign up, what then? What if not just one or even hundreds, but thousands or tens-of-thousands do. Then what? What will American agriculture look like in 5, 10, or 15 years if some farmers, most farmers, or all farmers jump into ag carbon markets?

To the practical listener, dwelling on this mystery might seem like pointless speculation. But if we know one thing about agriculture, it's that it's cyclical, and as David is apt to say:

**David Widmar:** "It reminds me of that quote that maybe Mark Twain said, it's 'history doesn't repeat itself, but it often rhymes.'"

**Sarah Mock:** Listeners of AEI Presents Season 1: Escaping 1980 will be familiar with that quote, and the idea that ag's past is a decent predictor of ag's future with a big old asterisk, of course. Setting those stipulations aside for now though, for Season 2, we returned to our Wayback machine in search of a moment in America's farming past that can offer some insight on what might be ahead.

Now the challenge is to find a period in ag history that rhymes with carbon markets. A moment when private investment in technology led the way to a new ag market that was meant to simultaneously create additional income for farmers, and to improve the environment at the same time. A moment when a new market for a crop seemed poised to fundamentally improve farm incomes over the long-term, while, at the same time, delivering many additional benefits to many people well beyond agriculture, in such a way that policymakers just couldn't resist supporting it.

Looking for such a specific moment seemed like a tall, maybe impossible, order, but we found one.

Here's David and Brent:

**David Widmar:** "We independently started collecting our own lists and ethanol was on all of our lists. In a lot of ways, ethanol came on the scene at the perfect time to save the day, and it was solving a host of problems that our country and our economy and our rural economy was facing.

And it sort of was a silver bullet. And we humans love silver bullets and policymakers love silver bullets too, and it was sort of a silver bullet when we needed a silver bullet. And it's important that we step back and realize how ethanol was solving those problems and how, as we moved down the road in our careers, we'll see other examples and parallel to this.

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**Brent Gloy:** I might not have it as, say everybody thought it was a silver bullet, as much as a nickel bullet, maybe, it's probably better than a copper bullet, but it was one of those things that we needed to have some hope that we could address some of the problems that were occurring and this offered that, and it offered a lot of other benefits too.

**Sarah Mock:** Sound familiar? We thought so. But I want to take a moment right here at the beginning to say that the similarities do not mean that ethanol is a perfect facsimile for carbon markets. Throughout this season, you might find yourself stepping back and thinking, “This is apples to oranges. These two – ethanol and carbon markets - things just don’t compare.” Good! This season we’ll be using the history of ethanol as a model for predicting the future of carbon markets, but we know that models are not perfect. Being able to recognize when a model is useful, and when it’s not, is a critical skill for savvy planners. So, if you’re feeling skeptical about this premise, we encourage you to be open-minded about what can be learned from this exercise, with the full knowledge that we don’t know it all and if you’re here for this comparison, I’ll just say -don’t put your skeptics hat too far out of reach.

A peak behind the scenes here - the bigger problem for us with looking deeply at the history of ethanol is, well, one does not simply podcast about ethanol.

**David Widmar:** If we do ethanol, it's going to be so controversial and so political and such a lightning rod that we're going to create enemies out of everybody. Everyone's going to hate us.

And therefore, it was kind of on our too hard pile for several months and we kept sort of avoiding this conversation. And I think that ultimately became the reason why we're doing this series is because it wasn't that controversial. It wasn't that political when the whole thing got started.

**Brent Gloy:** I think from my perspective, somewhat political, but it was not as partisan political and, and today's environment and 2021, everything is partisan. It seemed like back then there was more, you know, bi-partisan type of support for, the ethanol policy. And it's interesting to think about how the environment came to be.

**David Widmar:** I think this is why we want to do this is we want to really not get into the weeds of, should we have done this, or should we have not done this? Not tackling the “should” questions but stepping back and helping decision makers and those in ag today, especially those who have been in ag for the last 15 or 20 years, their careers are pretty new. It's easy to forget the situations and the circumstances that led to ethanol being such an important solution to problems that we had just 15 years ago.

**Sarah Mock:** So here we are, podcasting about ethanol, but we’ll aim to do it in a way that, rather than getting bogged down by what David called, “The shoulds and shouldn’ts” of the sector. And trust me, every single stakeholder in the biofuels space has a long list of how this

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story should or shouldn't have played out. Instead, we simply acknowledge that history is fact, and if the creation and acceleration of ethanol went like this, then what could that mean for carbon markets?

First things first, we need a heading for our time machine. We'll be paying the most attention to the fifteen years between 2000 and 2015. Though ethanol has been researched and produced commercially for decades, and was originally invented in the mid-1800s, we'll focus on the period during which renewable fuels became indelibly linked to agriculture, and when corn growers took corn ethanol from a DIY fuel for backyard chemists and environmental true believers to a billion-dollar industry in a matter of years. We'll meet you in the past, right after this break.

[[COMMERCIAL]]

In order to find the tools, we need to understand the future of carbon markets. we're going back deep into the details of the ethanol market, to explore who was making decisions, and why, what was happening in the wider world, and what other options were on the table. But first, let's get some background on where we're headed.

In the beginning, at the dawn of the age of ethanol, the world was – well - full of corn.

**Brent Gloy:** Coming out of the 1980s farm crisis, we found ourselves in a situation where we were producing a lot more, of everything than we needed from an ag commodity standpoint. So that boom that we talked about in *Escaping 1980s*, created a lot of supply response. And we're in this position where we're just constantly searching for something to increase demand.

We had, a very efficient production system and we could produce a lot and we knew we couldn't consume anything close to what we were producing.

**David Widmar:** When we came out of the late-90s, early-2000s, we spent a lot in government payments. We were having a public debate about how expensive government payments were at that time. Of course, we were trying to move away from LDPs - the loan efficiency program. We put in some form of effective price floor, and we're trying to get to, more of a direct payment system. So that was going on, on the farm policy side. Then, in 2004, we raised an absolutely monster corn crop – like 160 bushel per acre. So, in today's terms that's not that big but it was 18-bushels above the trend, which, in today's terms, would be well over 195 bushels to the acre for the national corn crop. So, the narrative at this time in agriculture was, "What are we going to do with all this stuff?" And how are we going to find uses for all of the corn and the ag products that we're producing?

**Brent Gloy:** And you started to see people, look at things like, well, what are some alternative uses for corn? What else could we do with it besides feed it to cattle and export it out onto the world market?

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**Sarah Mock:** This extraordinary oversupply of corn meant that it could be a tremendously lucrative endeavor to figure out ways to turn ubiquitous and super cheap corn into something worth, well, more money. Whether that was sugar or plastic or, you guessed it, fuel.

**Brent Gloy:** And ADM at the time they had built these kind of very large ethanol plants and they were trying to get ethanol – it was called gasohol, I think, back in the day – because ethanol was used in other countries, Brazil, I think has pretty big ethanol industry and it used a lot of it.

And so, I think people are coming back saying, well, maybe we could use some of that here? And ADM built those big refineries that kind of tried to split corn into all these components – ethanol being one of them - and sell some of it. And I think farmers were always like, “Oh man, if we could just sell a little more ethanol,” and that was kind of the start of it.

**Sarah Mock:** The farm economy wasn't existing in a vacuum either. Beyond the farm gate the world was changing fast, and in unimaginable ways.

**David Widmar:** We had the 9/11 terrorist attacks and all of a sudden everyone's thinking about oil and energy independence, and we started fighting two wars in the Middle East. The prevailing thought was, this is an unstable, a risky situation and gas prices were at that time high, and people were getting concerned about how are we going to, manage all of this?

And there are also conversations about, you know, peak oil, like how have we found some of the last barrels of oil? Do we know all the known oil reserves? And there's a chart that, that I like to put up from time to time and it's U.S. gasoline consumption, and it goes back actually to the 1950s, and if you draw a linear trend line through that, the trend line captures 95% of all the variability, right? And this chart goes up and to the right, and there's just not many years where gasoline consumption had gone down. And so, we're sort of looking at this problem of how are we going to source gasoline for our economy, for the U.S. economy, when we keep consuming more and more gasoline? And we have the situation in the Middle East - is there more oil reserves out there? What's it look like? And so, there's some real concerns around that.

**Sarah Mock:** The oil and gas industry - with their soaring profits and global dominance - was at the heart of this anxiety, which was, for the first time in almost 80 years, leading to real talk about alternative fuel sources. And it just so happens to come at the same time as those rumblings in the ag industry that Brent mentioned that idea among farmers of, “If we could just sell a little more ethanol...”

**Brent Gloy:** It kind of came a time where we said, “Well, you know, boy, we can produce this stuff - we just, the policy, because the oil companies are never, ever going to let us, sell gasohol or put ethanol in their gas.” They've got things they put in it. We've got to find a reason to get the stuff in the gasoline supply. And I think it became pretty obvious all along that policy was going to have to be required to do that. And I think there were some states - Minnesota, I think had an

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ethanol policy that, try to encourage gasohol and all that stuff - but it really became obvious that federal legislation was needed. And then I think once the Renewable Fuel Standard got passed, the political winds shifted enough that that could happen. That started the real gold rush in ethanol.

**Sarah Mock:** Ah, there it is - arguably the most treasured federal policy in agriculture, beyond the bi-decadal Farm Bill, the Renewable Fuel Standard. We're going to talk a lot about the Renewable Fuel Standard or RFS in this podcast - both versions actually, RFS 1 and RFS 2 (we'll unpack those later). But what you need to know right now is, the RFS is the U.S.'s national biofuel policy that created a mandate - a legal obligation - for the oil refining and blending industry to, as a whole, blend a minimum amount of ethanol into the national fuel supply. And that ethanol - in the beginning at least - was essentially all going to be made with corn.

**David Widmar:** And so around 2005, we passed this RFS. It was going to sort of potentially fix some of the ag problems. It's going to potentially help add to the gasoline supply. And that's sort of when everything started to move in that direction. So, ethanol was seen as a way to sort of add to the gas supply.

How can we add to the gas supply? And how can we do it in a way that, that helps the economy grow? And then, also, we had the, I think in 2006, an Inconvenient Truth came out, right. There were environmental concerns and ethanol had some features that were desirable, and ethanol was seen as a solution to boost the fuel supply. Homegrown, you know, made in America, had a renewable element to it and it had some environmental appeal. And so that was sort of the kickoff.

**Sarah Mock:** Like it or not, we're going to get real intimate with the RFS this season. And honestly, despite how mind-numbingly boring the origin stories of many federal policies are, the story of the RFS is wild. We'll dig deep into the torrid political details in a later episode, but for now what you need to know is that prior to RFS, the ethanol sector was little more than a smoldering ember. The mandate the RFS created, with its requirements that oil blenders purchase billions of gallons of ethanol or other biofuels, doused that smoldering ember in lighter fluid. David remembered what that acceleration looked like on the ground.

**David Widmar:** One memory that sticks out to me is in 2006 and, we were up in Kansas. So, corn was a pretty new crop for us in '06. And so, I was helping market the crop. And for a few, several years before that we were in this, what we call the stable area of agriculture, which means the budgets, the cost of production, the price that you can receive, the cash rental rates, farmland values - they sort of had been in this multiple year, not a rut, but sort of this level, this rung of the ladder and they're pretty predictable. And I remember in 2006, in the fall, there was this rally that started to take place and, you always were hoping for like \$2 corn, \$2 cash prices for corn and the futures price had been trading around \$2.50, throughout most of the summer and in the early fall it dipped. But then, you know, as we got into October and into November, corn, all of a sudden took off on this rally. So instead of trading around the \$2.50 on the futures price,

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hoping for \$2 cash, it all of a sudden gets to \$3.50 by that December. And so, there had been about this dollar movement and that to me was sort of this first, whiff of enthusiasm that I can remember. Cash rental rates start, getting a little more interesting, start looking at some, maybe some new equipment. There were also the rumors of ethanol plants giving some pretty big returns. And so, there was just a lot of enthusiasm starting to build up there.”

**Sarah Mock:** But like all booms in agriculture, they don’t last forever. And in the late 2000s, the agriculture sector got a preview of what lay ahead.

**David Widmar:** Things got kind of hectic I believe it was in 2009 - commodity prices tumbled a little bit. I think some of it was from the financial recession that the U.S. economy was going through, but we had stock starting to build, fertilizer prices were really high, and so producers had not a good outlook in 2009, because the costs have been going up and commodity prices quickly turned lower. And there's a bit of a year there that wasn't very good. But then by 2010 and 11 things really started to get exuberant. 2011 is when, I think, the drought started widespread, it was mainly a Southern Plains drought - my family farm is in Kansas and that was probably the worst, far worst year for us, drought-wise. And then 2012, of course, it spread all the way into the Corn Belt and the Eastern Corn Belt. And that's when the conversations were high commodity prices. “How long will this last?” “What's on the other side of the boom?” And also, I guess, the narrative about food versus fuel - all the concerns about what's going on with ethanol. And what are the implications of what's going on here? That's when all that sort of started to come together in my mind.

**Sarah Mock:** Though in agriculture we often talk about ethanol and commodity grains in the same breath, it’s important to remember that though these sectors are closely linked, they aren’t actually one and the same. Or one the extension of the other. Each experience their own pressures, their own rallies and slumps, and as ag markets experienced their wild ride throughout the late-2000s, the blooming ethanol industry was dealing with growing pains.

**David Widmar:** Part of it was how do we get financing to build some of the plants that we wanted to build? Or how do we get the financing to continue operating these plants? But I think the other issue was gasoline consumption stopped its upward trajectory. It sort of stalled out and, in fact, gasoline consumption turned down for a few years, and it's interesting how that trend that had gone on for six decades sort of paused. And then the 2012, high commodity prices added a lot of pressure to that situation.

**Brent Gloy:** And it peaked, I think, in the drought of 2012, when, we didn't have too much because we'd been using a lot of corn for ethanol or aggressive feed milling, and China's buying lots of commodities, a lot more than they ever had in the past.

So, there's a lot of, kind of big demands going on right at the time. And then we had a drought in the middle of it and it pushed prices really, really high and, challenged the economics. And people started to go, “Well, this is not very good because we have to buy it.” And we’re going to

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have to pay whatever price it takes the buyer and we're short so, somebody's got to do without. And that I think was kind of the peak of the ethanol industry is when that happened - we kind of ran out of that excess supply and it turns out it was temporary. The drought didn't last forever. We've got enough again, but that brought a lot of attention to it.

And, you had grocers out with food versus fuel and all of that, that they started when prices got high. And then, since then it's kind of become this problem that, we're produced pretty much all that we can with the Renewable Fuel Standard.

**Sarah Mock:** From Brent's perspective, and the perspective of many analysts and market watchers, ethanol usage today is just about where it's going to be for the foreseeable future - barring major policy changes that could increase the blend mandate. The tension, between ethanol and the oil industry, which revolves around that mandate, has become a political lightning rod, with lawmakers and advocates on the sides of the respective industries fighting fiercely to either increase the mandate or reduce it.

**David Widmar:** It's turned into a very intense game of political maneuvering or legal maneuvering. And it's where the rubber had to meet the road. Whenever gasoline consumption was this growing pie, and we were allocating slices and the pie kept getting bigger and bigger there wasn't a whole lot of squabbling. But what happened after the financial crisis and what's happened over the last decade in the U.S. economy, is that pie was fixed. And every additional gallon that ethanol was bringing in was eating up someone else's market share, right. And so now we're reading the texts very finally to figure out how exactly do we allocate this pie that didn't grow as we initially thought.

And one of the takeaways that's kind of hard to wrap our minds around is ethanol is no longer a source of growth for corn usage as it was from 2005 all the way through 2014, 15. It's sort of a very flat, market. And so, I think a lot of folks are frustrated and worried about it going to zero.

I don't think Brent and I have that concern, but we have to sort of also realize ethanol isn't what it used to be. It's sort of stable. It's probably very linked to the national economy - we used gasoline consumption, and ethanol is a part of that - during the pandemic and the social slowdown in 2020. And so, it's in there, but it's not a source of growth. It's not growing anymore.

**Sarah Mock:** This is, largely, where we find the ethanol sector today - not growing significantly, but not diminishing significantly either. Despite that, ethanol production remains a key source of demand for U.S. corn growers consuming about 5 billion bushels, or more than 30% of the U.S. corn crop, annually. Yet along the path the ethanol sector has traveled in the last decade, it's accumulated a lot of critics, skeptics, and all-out enemies, which have contributed to the general sense that ethanol's days could be numbered.

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We'll breakdown these critiques as we come to them, from the question of whether a gallon of ethanol contains more energy than it takes to create it? To the food versus fuel debate, to the threat ethanol production poses to Brazilian rainforests. But while crafting this discussion, we started to recognize something of a pattern - that many, if not most, of the complaints about ethanol, are not complaints about a policy, market, or system that failed, they're complaints about one that worked.

**David Widmar:** I was reminded of the Batman [movie] with Christian Bale, *The Dark Knight*. And there was a line from that - it's, "Either you die a hero, or you live long enough to be a villain." And I think ethanol lived long enough to become a villain. And in a way it became a villain because the policy worked. Ethanol became a huge source of supply for gasoline. And so, I think that was part of what happened. The other thing that occurred is, we have to always step back and realize some of the outcomes that were happening were very agreeable and desirable when we passed the RFS, we wanted to force corn into gasoline through the mandate. We wanted to mandate X number of gallons of new gasoline - that was the entire goal of the plan policy. Now, when you fast forward to 2021, and you say, you know, gasoline usage hasn't increased over a decade, why do we need to be mandating the use of corn for going in ethanol? We always have to remember the policy was made in a different era than where we are today.

And so, along the line over 15+ years, ethanol has picked up a few new villains as the environment has shifted.

**Sarah Mock:** We'll spend a lot of time over the coming episodes, discussing the many and diverse reasons behind ethanol's transformation from an almost universally celebrated darling among environmentalists, the energy sector, farmers, rural developers, and even patriotic nationalists, to how it's perceived today. By many environmentalists as a misuse of resources. By the energy sector as an unfair burden. By investors as a tarnished opportunity, and by most consumers as something they never really think about outside the few moments, they happen to be standing at a gas pump, staring at a "contains at least 10% ethanol" sticker.

As we sort through all of this complexity though, I hope you keep David's idea here in mind. We like to imagine the RFS, and the ethanol sector it created, as a superhero, fueled by corn. The RFS had a goal, or arguably, many, the main one being to save the American economy from the threat of expensive oil. Like any good superhero, the RFS did that. But, like any good superhero - or person, or imperfect human idea - the growth of the ethanol sector had unintended consequences, creating something like collateral damage. Eventually and inevitably, the unintended consequence and collateral damage came back to haunt the ethanol sector. The hero became the villain. I prompt you to keep this in mind because, we love a hero story, especially one where farmers get to be the heroes. And to us, that seems like one of the most striking similarities between ethanol and carbon markets.

**David Widmar:** We have a set of problems in 2021 that we're trying to solve, and they're sort of national priorities. Climate change and carbon emissions are one of those problems and policy

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makers have a set of tools that they could use to tackle carbon emissions. And, you know, we don't want to tax carbon at this point. We don't want to cap and trade it. And so, policy makers are always sort of looking for the easy silver bullet. And I guess Brent would say, it's the nickel bullet, right? Because there are no silver bullets, but right now carbon has sort of a very attractive appeal to solving the problem. And I think ethanol had a very attractive appeal. There are other ways that Congress and the Bush administration, could have tackled the issues that they were facing in 2005. How do we slow down our nation's dependence on gasoline? We could have limited the use of gasoline maybe through tax or, you know, they also extended daylight savings time in that period because they wanted to conserve energy. There's a lot of ways that they could have solved the problem then, and they chose that sort of easy silver bullet that wasn't perfect. I think we're doing something similar today.

**Sarah Mock:** As David and Brent see it, much of the conversation around carbon markets today has a very similar flavor to this old ethanol discussion, but sub in carbon for gasoline. The problem is there's a simple way to reduce carbon emissions or gasoline consumption and we already know what it is - tax it. But that simple solution looks undesirable to a lot of people, so other options are sought, which are inevitably more complicated, likely less effective, and potentially more expensive. In other words, the alternatives involve real tradeoffs.

**Brent Gloy:** This is a thing that we're viewing right now as a quick fix, a way to solve our problem, which is, we have too much carbon emissions. And the obvious way to fix it is to make things that create carbon emissions is a lot more expensive than we'd use less of them. The obvious thing to do that is a carbon tax. It makes it, more expensive and people use less of it, but we don't probably want to do that because people don't want to face the cost. And I don't want to sound political, but it probably is, but I mean, you have a president today whose administration is really focused on, green and the environment and things. And the administration the other day was calling for OPEC to increase oil production to reduce gasoline prices, which you would think, if you really want to improve greenhouse gas emissions, high oil prices are thing to do it. And I don't think it's a comment on them as much as people in general. People don't like to pay the price of change in behavior. It's a trade-off. And so, we come up with this idea, "Well, we can get these offsets and permanent credits instead." And incentive people do good things. Well, yeah, but what if it's really costly to do those good things? And those prices are really high? I don't think people will pay for it.

**Sarah Mock:** If you're anything like me, this question, "What if the cost of change is high? will cause you no small amount of existential dread. We know the answer. The cost of significantly reducing carbon emissions, is very high. If Brent is right, then, perhaps the outlook for selling high priced ag carbon credits is bleak.

Brent, if you can't tell, is a bit of an ag carbon skeptic. But it's worth pointing out that it's not that Brent thinks that ag carbon markets can't be set up and made to function, with farmers creating and selling credits and people showing up to buy them. Brent is skeptical that ag carbon markets could actually motivate a reduction in carbon emissions overtime, which is ostensibly

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the goal of them. Essentially, Brent argues, it's expensive to motivate farmers to sequester a lot of carbon, and people and companies are unlikely to shell out for the actual cost of that work. In other words, money could trade hands in an ag carbon market all the live long day - in fact, it already is. Ag carbon markets already exist and function - and still have a negligible impact on the actual amount of carbon in the atmosphere.

We'll spend a lot of time exploring the science and economics of how ag carbon markets and credits do and don't work. But there are two key ideas to keep in mind at this point – One, a successful ag carbon market is not the same thing as successfully reducing carbon in the atmosphere through agriculture. And two, big changes are expensive, and eventually someone, somewhere has to pay for them, or they don't happen.

For now, we'll set aside the big scary goal of actually reducing carbon emissions, to take a closer look at the much more contained goal of establishing a working ag carbon market, and what that might mean for farmers. Many today are hoping that relatively small changes, will be monetizable in carbon markets, while others are optimistic that activities, they're already doing will be their ticket to payouts. The difference between these two might seem minimal, but it's not as insignificant as you might think.

**David Widmar:** I always find myself trying to figure out how to take a manure product and turning it into gold, right? How do you take something that has no value and create a lot of value out of it? And so, I think on the one hand are we were too early to know exactly what this carbon project is, or what these carbon markets are going to do. Are we turning something that we're already doing into a revenue stream? Are we able to turn something that has zero value today and are we able to create new value out of it? And I think, if we're using a practice that now we can get compensated for and we can generate new income. If that's the case, then we could think about how much of that income is that those new dollars, right? How much of that is in the form of income for the producer versus gets bid into capital assets, such as farmland or cash rental rates, right? How does that translate the underlying economics of the farm sector?

**Sarah Mock:** And think about those new dollars we must because the problem with turning something you're already doing for free into an income stream is that if you can do it, so can most everyone else. And though the optimist might see a rare opportunity for a rising tide to lift all boats, the reality is, as David point out, that what we'd expect this to do is inflate land prices, equipment prices, and other costs in the agricultural sector over time leading to wins for some farmers, losses for others and overall, a possibly net neutral result, rather than the all-around win that carbon markets often get sold as. But let's assume that ag carbon credits are not something that every farmer, everywhere can creates, and that they are a real, verifiable, and valuable product. Then there is a real chance that carbon markets could follow in ethanol's footsteps. Ag carbon could receive federal backing - a mandate even. Farmers could get in and buyers could show up. What then?

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**David Widmar:** What if it works? And what do we do 10 or 15 years from now, if we have dramatically reduced carbon emissions and you know, that isn't a huge source of demand for our ag resources, right? What if there is no longer growth? And so, maybe climate change isn't as big of an issue 15 years from now, because maybe we solve the problem, or maybe we've learned more about a different problem. And I think that's just really important to think about with ethanol is where we are in 2021 with ethanol is we're kind of debating, are we at peak ethanol usage or not? And so, it has its challenges and I think similarly for carbon. What's the growth down the road if it works? I think there are still big questions around that, but it's not going to be a source of new demand forever. We're going to find a way to meet that demand. And if it's unique to agriculture, we'll figure out a way to supply a lot and we'll eventually oversupply. And then there'll be a situation where we're trying to deal with maybe too many carbon credits in the market.

**Sarah Mock:** Obviously, for the world in generally, this is an incredibly hopeful future to imagine. One where there's not a particularly strong market for ag carbon credits, because we've averted climate change. But there are other, less positive ways to reach the same end. For example, what if a technology comes along that sucks carbon directly out of the atmosphere and stores it more reliably or more cheaply than farmers can in soil? One source I spoke to while researching this podcast predicted a future like that for ag carbon. One where in a broad and sophisticated market for carbon credits, ag carbon credits are something like a penny stock – of low value and in low demand. But it's not just the risks to ag carbon markets from outside the sector that we'll be considering this season, there are also the internal risks, and the ways that new demand alters incentives in ways we don't always expect.

**David Widmar:** Then I guess there's another way that this could potentially impact the farm sector is now we have a carbon market out there that's incentivizing us to change the way we produce food. And I think that starts to become way more complicated. And one of the things that happened with ethanol is if you take one bushel of corn and you turn it into ethanol, it's not going to impact the market much at all. On the margin, every bushel of corn you turn into ethanol, isn't going to be a problem. But all of a sudden, when you convert a huge share of the corn crop to ethanol, then these debates start happening. So, what happens now if the carbon market, is in there bidding against corn for acres? What if we're sort of permanently putting acres into grass? If I can get X dollars an acre to do no-till or cover crops, how much can I get to put the whole farm into grass on a more permanent basis? I think that's sort of the next question. Is, is it going to be competing with our traditional outputs? Is it going to be competing for the resources that we traditionally use for, you know, grain or livestock production? That's a question that I don't know at this point, and I think that's when the carbon market's going to start to maybe go under some of these more questions of, are we going to use this for food versus carbon offset debate? Or whatever that, that next sort of debate is.

**Sarah Mock:** And that's where we come full circle, where ethanol and carbon markets come head-to-head, so to say. We'll explore the competition for acres between food, fuel, and soil carbon, and we'll do some informed theorizing on the future of American ag later this season.

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So that's our mission for this season - first, we'll understand the history and economics of the ethanol era in agriculture, from the pre-RFS origin story through hitting the blend wall up to the current uncertainty we face today. Then, we'll take the lessons learned at each of those stages and discuss how they might, and might not, apply to carbon markets. At the end of the season, we'll spend some time looking into the future of both ethanol and carbon markets and seeking advice on how to prepare for what might lie ahead.

Speaking of which, this season, we're mixing things up, and reaching well beyond David, Brent, and myself for expertise. In the episodes ahead, you'll hear from farmers, investors, advisors, and policymakers who dream, live, and breathe ethanol and or carbon markets. You'll hear what they've learned and how it's informing their thinking as North America's native crop suits up for its latest mission.

But that's next time, on Corn Saves America.

AEI Presents Corn Saves America is a production of AEI Premium, produced and edited by me, Sarah Mock, with special thanks to David Widmar, Brent Gloy, and Sarah Hubbard.

Our music is by Valentina Gribanova and Boris Skalsky.

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