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Corn Saves America
Episode 4 – Chosen Too

Sarah Mock: This is Corn Saves America, a podcast exploring agriculture’s environmental solutions, from ethanol to carbon markets. I’m Sarah Mock.

Last episode, we talked about the first and second renewable fuel standards, the policy decisions that led to them and the goals they achieved in the aftermath.

This episode we’re switching our focus to a much murkier topic, the possible futures of ag carbon market policy. I want to say right here at the top of this episode, currently, ag carbon market policy is still largely hypothetical, but we have our history to guide us, and to help us understand what the creation and passage of the RFS might mean for possible future carbon markets.

One of the best quotes I heard while researching the possible futures of ag carbon market policy, came from Jeremy Martin, senior scientist, and director of fuels policy at the Union of Concerned Scientists. He offered me these words of wisdom for thinking about what comes next.

Jeremy Martin: It's not just turn on the market and the benefits appear and everything's great. It's a lot more complicated than that. So, how exactly is this carbon market going to work? And once you figure out some rules that make technical sense - what's the scientific backing for them? And then once you figure that out, like how's that actually going to play out, right? Who's going to win, who's going to lose.

Sarah Mock: Tracking those potential winners and losers, understanding the impacts of simple versus complicated market structures, and keeping an eye out for players and motivations that could morph the goals of a carbon market will be our focus for today’s episode. And because there’s a lot to cover, I’m going to break this conversation into two general parts - first, we’ll talk about the policy-led market development options, which would likely come from Congress, and would look potentially like an RFS - mandated amounts of carbon credit purchases, tariffs on credit imports, and potentially even subsidies for credit creation.

Then we’ll talk about the policy-support, industry led option, which would like put USDA in a third-party role as verifier or guarantor, but not force any participation. The first option, obviously, would be much more impactful for agriculture financially, and for the goal of drawing down carbon emissions in the U.S. economy. The latter, well, is what we actually seem in line to get.

So, let’s get into it.

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I want to start where I think we'd like to believe policymakers start when thinking about tackling a big problem, with all the options on the table. I asked Dr. Aaron Smith from UC Davis, what the options are, and what he thought might be the simplest and most efficient policy option for motivating agriculture to draw down atmospheric carbon.

Aaron Smith: As an economist, I think they take away your card if you don't say that, what we should do is just put on a carbon tax and be done. And so, you tax people for their emissions.

Sarah Mock: I'm sure for any farmers listening, the idea of a carbon tax, as an alternative to an ag carbon marketplace, is a deeply unwelcome one. I get it. But in terms of the best economic policy for achieving the goal of reducing carbon emissions in the U.S. economy, it's arguably the simplest and most efficient option. It's worth noting that, though farming activities could be capable of sequestering carbon, most commercial farms today are net emitters, creating more greenhouse gas emissions than they sequester - through everything from raising livestock, to putting diesel in equipment, to applying fossil-based fertilizer. If we put ourselves in the shoes of policymakers then, we can dispassionately understand that for the economy as a whole a carbon tax is likely the most fair option. Because if farms, or any other business, are not emitting much carbon, their tax burden would be low, and if farms, or any other business, are emitting a lot of carbon, their tax burden would be high. Everyone, then, pays for their own contribution to the collective burden of climate change. Of course, Aaron points out the problem here, that we're not all that good at tracking carbon emissions on that kind of individual level.

So, then we arrive at second best solutions - policymakers can either force farmers to reduce emissions through regulations or pay them to. Use a policy stick, in other words, or a carrot. Which they choose, as Aaron points out, is not an economic question, but a political one.

Aaron Smith: So, there's a few questions here. There's the who pays question. If you are applying nitrogen fertilizers and those fertilizers are causing emissions of nitrous oxides, which is a greenhouse gas, or if you are a livestock farmer and you have, cattle who are emitting methane into the atmosphere, then is it your responsibility to reduce that? Should we be coming up with regulations to try to force agriculture to reduce its emissions? Or do we pay farmers to reduce their emissions? And there are some cases where, you know, that place that you end up in terms of how much pollution you have, ends up being about the same, whether you do it one way or the other, it's just who do you want to bear the burden? If you want to place the burden on farmers or you want to place the burden on taxpayers? So that's a political question.

But I think, it's not helpful when you have policies that are based on things that you can't really measure well. And so, a lot of sorts of offsets type markets, including carbon markets, I think are set up that way. And so, A so it's going to be expensive to operate in, and B you're not likely going to, or you don't know if you're going to get benefits. My guess is you're probably not going to get the benefits you think you're getting, or that you're trying to get out of, out of programs

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like that. So I would be more in favor, I think of simpler, more transparent policies that are based on things that we can measure.

Sarah Mock: We're going to talk a bit more about measuring carbon sequestration later this episode, and we'll get even deeper in the weeds later this season, but it's worth noting that, at the end of our conversation, Aaron argued that of all the options on the table, it's neither a carbon tax, the stick, nor the ag carbon markets, the carrot, that he thinks will actually prove effective in reducing U.S. carbon emissions.

Aaron Smith: I think I'm in a position where, you know, I started from a standard place as an economist to say, "Well, we should tax carbon emissions. We should tax nitrogen because that's a cause of lots of different pollution and we should, tax methane emissions."

But over time, I think I've moved towards the idea that probably the most important thing we can do, especially for climate, is technology. And investing in research and development to reduce the amount of methane that's admitted from cattle by changing feed and by all kinds of other tech by, you know, precision irrigation and precision fertilizer application, which is going to potentially markedly reduce those kinds of runoff and emission. I think, those solutions are probably the kinds of solutions that will stick, rather than a fancy program. So, my priority would be investing in technology, and I think, the differences between whether you subsidize farmers to try to reduce emissions in some way or you tax them for not reducing emissions - those things have political implications that I'm not qualified to talk about. But also, I think they're in the end, not going to be the main story. I think the main story is going to be can we develop new technologies and how do those go in order to make agriculture cleaner?

Sarah Mock: Aaron's idea about policy investing in technological solutions raises a good question: How much of today's problem will technological advances solve? And how should we think about those potential gains while making decisions today?

This idea, that technology might be the secret to outwitting capital and environmental constraints, and maybe has the potential to solve all our thorniest problems, is a mindset we've learned because, for better or worse, technology has helped us out of a lot of sticky spots before.

Perhaps the most famous of these spots, is something called the Malthusian Trap. Proposed by Thomas Malthus in the late 18th century, the trap is, essentially that because the human population grows over time, and the world is a finite place, that eventually, human populations would reach a country's or the Earth's carrying capacity, we would, in other words, become overpopulated. He predicted that widespread famine would occur to bring the human population back in line with the productive maximum of the world around them.

As you might have noticed, the world population has increased quite a bit since 1789, when Malthus was penning his theory, and through technology gains, we've wormed our way out of his trap time and time again, and continued to grow the human population, and, in most ways

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also grow standards of living, far beyond what Malthus perhaps believed possible. But the downside of betting exclusively on technology - future technology tremendous uncertainty. What if that future technology doesn't move the needle enough, or at all? A big cautionary tale emerges from ethanol's rise when Congress bet on a technology that totally failed to materialize - cellulosic biofuels. Which we'll talk about in exhaustive detail in a few episodes.

In short, the risks of focusing on technology development that might one day work, when we know of something today that definitely works- changing agricultural practices to sequester more carbon, is terribly high. In even fewer words, hope is not good ag or climate policy, even if technology does improve Earth isn't worth the risk.

Let's go ahead and take it for granted then, that policymakers can't simply dodge the carbon tax vs carbon credit question altogether - investing in technology alone is not an option. To some of their credits, many lawmakers are talking about these questions, and ag policymakers for sure have come down unanimously on the side of ag credit markets. When we look around the country and the world for existing carbon market policy, what there is looks mostly uniform - they're called cap and trade systems.

I want to bring back Aldyen Donnelly, co-founder of the Nori Carbon Removal Marketplace and longtime advisor in the energy and climate investment spaces. When I asked her what she thought about existing carbon market policy discussion, she surprised me by challenging whether what is on the table even is a carbon market.

Aldyen Donnelly: Right now, when we talk about carbon markets, it's interesting. We say carbon markets, but we mean emission quota markets. So, when people talk about cap and trade and allowances and credits, they're talking about trading a certificate that is an entitlement to discharge one ton of CO2 equivalent.

Sarah Mock: Aldyen here is describing systems like the one in California, and other broad national and international discussions about controlling carbon emissions. Her critique goes like this. Cap and trade systems, where total emissions are capped, and companies can trade amongst themselves to emit under a certain limit. Is economically equivalent to a kind of supply management. Some of you might be familiar with, for example, dairy supply management in Canada - for example, where the government determines the amount of dairy that should be produced, and producers are given quotas to make it. It's a strategy that keeps over-supply from crippling prices and getting out of control. But Aldyen argues that, if the aim is to have a healthy, competitive, innovative market, supply management is a bad idea. It removes rewards for innovation, she says, and limits competition. Plus, she points out, we have good historical evidence that there's a much better way to achieve environmental goals.

Aldyen Donnelly: Whenever we've been serious and successful, including under the Montreal Protocol and the ozone-depleting substances, we did not create or establish or trade to discharge emissions. We didn't regulate emissions. We didn't control emissions. Governments did not give

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away for free and sell emissions quota. When we got serious about getting the ozone-depleting substances out of the refrigerant chemicals supply chain. We said, “Okay, here's the greenhouse gas equivalent.” If you supply energy, I don't care if you supply gasoline, aviation gas, and diesel, and I supply electricity, natural gas, and propane - you report your global supply chain fossil carbon and you've got to reduce it by 3% or 4% per annum, and any combination suppliers can comply jointly.

Sarah Mock: You might be feeling a little Deja vu about now, given that last episode, we heard from Aaron that this simplified idea - that all companies be responsible for a set percentage of reduction across the board - would have been a much simpler alternative to the RINs market for ethanol.

In principle, Aldyen agrees - why overcomplicate the system with a fancy tradable credit market, when you could more easily offer a simple industry wide goal? And Aldyen says there's more to be gained with this approach than less complicated paperwork:

Aldyen Donnelly: So, you're not capping the emissions. You don't tell anybody to integrate ethanol in liquid fuels. Government doesn't set a price or try to set the price. Government doesn't say build wind turbines or solar panels. They just say to every energy supplier, “You figure out how to do it.” And every time we've said the suppliers remove reduce the version fossil content in your global in the global supply chain related to what you sell in my country. They always do stuff we never thought of before. All the private sector can do is compete on price and through innovation. If the government regulation says, “I'm setting the price, I'm government,” and “I'm picking the solutions, I'm government,” you've just completely disabled your market economy.

Sarah Mock: What Aldyen points out here is a fascinating embodiment of the idea that simple rules lead to complex behavior. When policy simply instructs all companies to reduce a specific amount of greenhouse gas emissions by a set amount, those companies are free to find any possible way to meet the goal and will likely find ones that policymakers could not anticipate. Opposite of simple rules are complicated rules, which often lead to simplistic behavior. This can be a good thing, if the policy's aim is to cause a simple behavior – say, blending ethanol. But if the policy's goal is to empower companies to find unique and innovative solutions, simple behaviors can be a real problem.

Aldyen Donnelly: So, government should be fighting over whether the annual reduction rate that everybody has to in combination achieve by 2050 needs to be 3% per annum or 6% per annum. That's what the big fight should be. And then some participants in the marketplace are going to get really good at recycling recovered carbon. And some are going to completely walk away from carbon intensive and others are going to integrate other sources of carbon, biological for version fossil. And we're not telling anybody what. So, I am saying the anchor, or the backbone of carbon markets has to be some form of regulation. The question is what's the simplest most straightforward and most cost-effective regulation in that context that mobilizes the market to do what markets do?

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Sarah Mock: “Picking winners and losers” has for the last several years become easy shorthand when criticizing government intervention, and I think Aldyen would agree - when the federal government does things like, say, mandate that oil refiners and importers blend a minimum quantity of ethanol, that’s picking a winner in a way that diminishes the benefits of a free market. It means that, in general, those refiners couldn’t seek out other, potentially cheaper solutions to reducing the environmental impact of their products or reduce their overall production to limit the scale of the requirements impact. The mandate in a cap-and-trade emissions system is not dissimilar from the mandate in the RFS, though instead of a cap-and-trade, the RFS is a floor-and-trade system. For carbon, since the market is overproducing it, the government sets a cap and allows companies to trade their quotas amongst themselves, as long as, altogether, they stay under the limit. Just as for ethanol, since the market was underproducing it, the government set a minimum, a floor, and allows companies to trade their quotas amongst themselves, as long as, altogether, they stay over the limit.

Despite the RFS’s benefits for farmers, Aldyen believes the cap-and-trade system for ag carbon would be a bad policy.

A question for us to ask ourselves at this point is - what would be the real goal of an ag carbon market policy? I would argue that the fundamental goal is to simply and efficiency draw down the amount of carbon emissions in the U.S. Aldyen argues that the best way to do that is to stop talking about an emissions quota market.

Aldyen Donnelly: We should be building a carbon market and you can write that regulation in 12 pages, and I wouldn't incorporate more than three what I call alternative compliance options, which is if anybody can demonstrate they're drawing CO2 out of the atmosphere and storing the recovered carbon in natural solutions, they get to issue credits that are useful in that compliance market. I wouldn't have 47 offset protocols – I'd have three crediting provisions in the deal. What's really strange is every time we've logged a successful major pollution reduction story in our history, we did it that way. We said to suppliers, “You take the pollution precursor out.” Why aren't we even talking about that as an option?

Sarah Mock: Aldyen’s right - in the U.S., this kind of clean reduction mandate is not on the table for discussion. Instead, policy conversations continue to revolve around the three most treasured words in carbon markets, voluntary, voluntary, and voluntary. We’re going to come back to Aldyen a little later for her thoughts on how USDA can provide that “backbone” to ag carbon markets that she mentioned. But we need to talk first about what having a voluntary ag carbon credit market actually means for farmers, and perhaps more importantly, for their carbon credit customers, because this obsession with voluntary leaves some major holes. Here’s Connie Bowen, an ag tech investor who’s been researching these issues deeply for a while.

Connie Bowen: The biggest challenge to me here, if I have a company trying to offset my footprint by financing a project, obviously I'm going to finance it where it's cheapest, which is

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not going to be in the U.S. It's going to be like preserving rainforests in Brazil kind of projects that are \$3 a ton carbon versus \$15 versus \$100 in, I forget which Nordic country. So, the fact that a ton of carbon costs so many different things in so many different places makes it really hard on the farmer end to plan for anything, like you kind of just have to assume that you can't actually sell that carbon credit. And I think that that's going to be the case for at least the near future, in absence of like super regulation.

Sarah Mock: Aldyen also spotted this weakness in the current ag carbon world, but her worries lie more in what might happen if U.S. regulators do decide to implement import tariffs for carbon credits.

Aldyen Donnelly: If we are going to trade emissions quota, we cannot make that market work unless we add import tariffs into the story - starting a whole new international trade. Whenever we've said to suppliers the equivalent of, "report your global fossil carbon supply chain content and reduce it." Every supplier is subject to the same regulation, regardless of whether they're located in the United States or outside the United States with no tariffs required, no trade war. Why are we picking marching towards a trade war when we don't have to?

Sarah Mock: Brent and David offered some other ideas of how, in the absence of regulation mandating participation in ag carbon markets there might be a lot less opportunity, and a lot more uncertainty, than the current hype around ag carbon markets might lead us to believe.

Brent Gloy: So, remember one of the big controversies in the Renewable Fuel Standard is whether we could import ethanol and it would count towards renewable fuels, right. So, you put the tariffs on it. So, if the government implements the carbon policy, then they could kind of say, "Well, it has to come from the United States. We're not going to allow offsets created in South America or Africa to count toward it." That would be much more positive for something like farmland and agriculture prices and demand and all that other stuff. Then if it were like an industry-led initiative and they're just going to go buy the offsets wherever they can find them the cheapest. Cause you don't necessarily have to buy them from the United States, so it's not like you can't import the credits from somewhere else. And, if you do that, I think the upside is much less. So, it will matter on what the policy actually looks like.

David Widmar: Or their board could just decide we're not doing it this year. I mean, they cut costs, they cut executive compensation, they'll lay people off. They'll shut down factories. If we get into a 2008-2009, like financial crisis, do you have to really wonder how cyclical that market would be?

Sarah Mock: When it comes to questions like this one, we just don't know what the future might look like. But it's not hard to imagine that if ag carbon markets remain voluntary, as they seem likely to, based on the current political climate on Capitol Hill, at the White House, and even at USDA, it's not hard to imagine a situation where, either because ag carbon credits are too expensive, or because money is simply tight in the economy, the demand for voluntary

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carbon offsets might dry up to, essentially, zero. A market that could, due to internal or external forces, fold up into nothing at any time, is not the kind of market that tends to attract durable, long-term investment, especially when what it takes to participate, like 10-100-year-long commitments for farmers, seem likely to outlast buyers' actual interest in owning the credit. Nevertheless, all these policy-led options for reducing emissions; from a carbon tax to mandatory carbon credit markets, to cap and trade emissions quota system, to environmental regulation, even carbon credit import tariffs, they're all on the table for policymakers to choose from. But what are they actually working on?

More on that after the break.

[[COMMERCIAL]]

Sarah Mock: When we consider the overall policy goal of reducing carbon emissions in the U.S. economy, ag carbon markets are not the simplest or most straightforward solution. But given that lawmakers don't seem to have the stomach for the first-best solution, they're focused on what seems to be a second-best solution – industry-led voluntary ag carbon markets.

I want to begin with the history again and bring back Aldyen Donnelley. She says the most important role of policy in functional ag carbon markets is to establish the quantitative backbone of the credit system. Because in short, it's really hard to measure how much carbon is being sequestered in any given soil, in a given region, at a given time, especially given an incredibly broad range of variables.

Years ago, actually, Aldyen was working with some big energy clients, to put millions of dollars into projects that brought together scientists and farmers to build the Prairie Soils Carbon Balance project. The USDA's COMET farm, that 2002 Farm Bill-funded network of farms, was actually modeled after this project.

Aldyen Donnelly: There's a good news, bad news story there - when everyone did a bunch of work and said, "How do we actually build an efficient, vibrant carbon market that serves the farmers well?" All of the experts agreed, and I think they got this right. They said we have all these ideas about changes in practices that we think will be very effective, we have a pretty good idea of the maximum potential or the saturation rate for building carbon stocks back up in soils might be, but we don't have a good idea of yet how to trace and measure it and it's still true. You'll never be able to build a market that works around the idea of soil sampling and testing in every field and striving for a super accuracy in year-to-year, short-term carbon stock estimates.

If you look at existing protocols and ideas about what we have to do at all prescribed soil sampling and testing in every field, once every five years, at least. The soil sampling and testing that will be done in those fields will still be only producing soil organic carbon stock estimates that have uncertainties of at least plus or minus 20%. And that prescription that we do soil

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sampling and testing in every field will eat up the first \$15 per ton of every credit that is sold in the marketplace. So, it's not very much money leftover getting to the food and fiber producer.

Sarah Mock: Aldyen said these test sites have not been maintained, and USDA has failed to continue to invest in providing this backbone for carbon markets, but that could change. But in the meantime, in general, companies building marketplaces are turning to more costly methods of verification

From Aldyen's perspective, there's a simple solution to this conundrum, rather than test every field of every farm that wants to participate, she says, the USDA should reestablish this reference network of test farms. This network would include thousands of farms, with various soil types, crops, rotations, geographies, and climates, and from it, the farmers and industry could draw certain baseline information. For example, that a farm in a certain region with say x practice and y soil types would sequester x tons of carbon. This Aldyen argues, is far preferable to making the wild assumption that, say, cover cropping everywhere is always worth a certain amount of carbon - which would assume that all cover crops on all soils in all climates must sequester similar amounts of carbon. The USDA would determine and track these specific figures through rigorous and regular soil testing.

Aldyen Donnelly: It's going to be more cost effective and more reliable to use the results we can extrapolate from the reference network of test sites to create estimates of what's happening in everybody else's fields. And then just doing random survey soil sampling and testing in the rest of the fields. So, we felt back then that the backbone of a robust and efficient carbon market for farmers requires the establishment and maintenance of this network of reference sites. In the 2002 Farm Bill, the USDA and NRCS had done some analysis and they said for us to build that efficient market, we need to set up in the United States and maintain 3,500 reference sites where we're doing really robust soil sampling, plant nutrient testing, everything to get the data we need to build a process model that's reliable enough to support a market. If you think about an analogy, weather - we have a robust 30-year-old weather derivatives marketplace that relies on data from a whole bunch of points, not every point. So, it was saying same thing. And the proposal to build, the U.S. carbon farm model based on 3,500 on reference sites was approved and fully funded in the 2002 Farm Bill. And then by 2009, when the financial crisis hit that budget got cut. And so, the expansion of the reference network, that's informing the modeling was cutoff when they were out to 1,200 sites and they got less than 1,200 active sites now. So, I'm of the view, the original plan was right. What we in the private sector got wrong is we thought that if government started, government would complete the plan. For entirely different reasons once we left it to government to maintain the infrastructure, it fell apart.

Sarah Mock: You might be able to hear a little squeaking sound from time to time in this audio, yeah, it's a parrot, yeah, a little grey fluff that walks in and out of the frame while we talk. Aldyen is totally unphased by his presence.

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Anyway, despite the USDA's lack luster history of maintaining this reference network, Aldyen still believes that this program could be recovered, and that there's a very meaningful role for USDA to play here.

Aldyen Donnelly: The same scientists who said in the U.S. that needed to be 3,500 sites in 2002 are saying today for that statistical representation, largely because the U.S. ag market is much more diversified right now, you probably need it to be more like 5,000 to 7,000 reference sites. But let's put that in context, you can build out that reference network and set aside the funding to do intensive, robust, testing in that reference network every three years - And if you set aside the public funds required to set it up and get through three test rotations out of the public purse you're not talking, you're not talking \$10 billion - you're not talking anywhere, nearly as much money as everybody's trying to figure out how to spend. If we build a reference network of 6,000 sites, as soon as we've got 20 million tons a year of farmer credits trading in a carbon market, which is 5% of their potential credit sales and we say to the private sector to maintain the network, you have to charge an infrastructure fee on your carbon credit sales going into the reference network infrastructure maintenance fund. That fee at a market turnover of 20 million credits a year, needs to be \$0.81 cents a credit.

So, we are right now charging down a path that is going to be giving us not highly accurate estimates. That's going to cause \$15 a credit to create a market that'll fall apart as soon as the government money dries up, which we know it will cause it always has in the past. When we could be charging down a path that is entirely consistent with the plan that Congress that approved in 2002, that the private sector would reasonably take over and where the infrastructure maintenance class costs are less than a buck a ton. Why are we choosing path A over path B?

Sarah Mock: Though we don't have a good answer to that question yet, let's take a closer look at what is happening in ag carbon market policy. The only piece of federal policy that currently exists related to ag carbon markets is the Growing Climate Solutions Act, which has passed the Senate but has languished in the House as of November 2021.

This bill, among other things, directs that USDA should create standards for voluntary carbon markets that would ensure "consistency, reliability, effectiveness, efficiency, and transparency." According to the bill, those standards would apply to everything from sampling methodologies to verification systems. In short, it introduces the U.S. Department of Agriculture not as builder of the reference network, as Aldyen recommends, but as simply a standard setter. A sort of objective third party among the private ag carbon markets, meant to uphold consistency in the way ag carbon credits are created, marketed, and sold.

I want to bring in Seth Meyer, Chief Economist at the USDA For his perspective on this regulatory support focus from Congress.

Seth Meyer: You've got folks with markets right now. You've got carbon markets right now. I think from USDA's perspective - my sense of the policy objectives at USDA is you want to

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enhance that price market for carbon, you don't want to become the market for carbon, right. You don't want to have USDA be the only person here who's backing this, using it, incentivizing it. No, my sense from the administration is more, how do we enhance this market? What information can we provide? What incentives, practices, technology transfers can we provide? If done right, USDA's participation here and enhances the stability of the market.

Sarah Mock: But what exactly does it mean to provide the right support? From Seth's perspective, it's very much about playing to the department's existing strengths, in particular, creating and enforcing standards that allow markets to run smoothly.

Seth Meyer: So, I think the one great thing about the carbon markets approach is you can take certain practices, choose your practices, choose multiple practices and you incentivize creativity, invention, and innovation in order to achieve that. One of the ways you can envision USDA playing a role here is - I think about USDA's role in, to some extent, in standardization and grading, and I think about number two, yellow corn. Okay. Well, we all agree on what number two yellow corn is. let's try and agree if we can think about what carbon markets look like.

I'm making this incredibly simple. There's a big challenge there in terms of what those credits are. I'm not making light of that. It's absolutely important, but you know, USDA is good at, "Hey, here's the standard. Here's, you know, number two yellow corn." And "oh, by the way, while we're doing this, let's help you think about how to establish these markets, lower your costs of growing, you know, provide you a bit of scientific research so you can take that same market development perspective that USDA does in number two yellow corn, and you could apply it to these markets."

Sarah Mock: Though not a perfect comparison, one of the reasons why this role is a natural and likely one for USDA, is because, just like RFS 2 was an expansion of RFS 1, so this role for USDA, as a verifier and market smoother, is an expansion of USDA's existing capacities, and wouldn't require as significant of a political or bureaucratic lift as alternative options. Seth is not without his concerns, of course. To Jeremy Martin's quote from the top of the show - "It's not as easy as turning on the market and the benefits simply appearing." There's unintended and hard to predict consequences of policy, as we learned from ethanol, but policymakers have to do their best to intend and predict and ensure policy doesn't lead to decisions that undermine the goals they set out to achieve. Seth predicts land use change might be a part of this story for ag carbon markets:

Seth Meyer: I think absolutely one of the things that folks need be mindful of, is there are limits to the amount of acreage you want to shift around to other commodities. You don't want to, all of a sudden have everybody saying, "No, I'm going to only plant soybeans and we're not going to plant any corn."

So, there is a balance in there someplace where you pick practices that might be crop neutral or encourage rotation, and perhaps creating a large suite of activities that qualify instead of one

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activity that might lead folks to say, “Well, that practice doesn't really work in my area, but I'm going to do it anyway. Cause they're shoveling so much money at it.” I do think folks worry about this in terms of how do we address the practices in the region without causing large disruptions that make us lose some of these benefits we're trying to achieve?

You're trying to add this policy element and you're trying to feel around, “Okay, what practices do I do I offer? And at what level do I incentivize these practices and not cause distortions?” And then, on top of that, this administration has its equity pillar. We talk about issues of scale or crop mixes. How do you achieve an environment where producers of all geographies, and economic opportunities, and relationships with the government, how do you get them to achieve the ability to participate in this as well, too?

Sarah Mock: You might have noticed that in this snippet, Seth is very much focused on practices, as opposed to Aldyen’s focus on field testing, reference sites, and verification. Seth is alluding to the fact that, in many of the current ag carbon markets, soil carbon itself is not being reliably or regularly tested but instead farming practices, like conservation tillage and cover cropping are used as proxies - the assumption being that if you were not using cover crops before, and you are now, some extra amount of carbon must have been sequestered in the transition, so a carbon credit can be created and sold. From Seth’s perspective, USDA’s support role would complement this work.

This is the moment when we need to make a clear distinction between the implicit and the explicit goal, in general, of existing ag carbon markets. The explicit goal, in most cases, is to drive practice changes among farmers, to reward them financially for adopting certain chosen practices. That goal, as it stands now, is not the same or equivalent to the goal of actually reducing the net amount of carbon being emitted in the economy. Net carbon emission reduction is the implicit goal of ag carbon markets. This is a key distinction between Aldyen and Seth’s positions, Aldyen’s idea is aimed at verifying that the implicit goal of net carbon reductions is being met, through a reference network of verified farms, Seth’s idea is aimed at supporting the explicit goal of existing ag carbon markets – to standardize practices-as-proxy for carbon sequestration. These are two very different approaches and likely will lead to very different outcomes. Only one of them is likely to actually lead to net carbon emission reductions.

It’s worth asking the question here - is it even necessary for the USDA, let alone Congress, to be involved in ag carbon markets? Isn’t the fact that these markets have come into being and begun operating on their own, a good indication that intervention is not required? I’ll point out that ethanol also existed as an industry before 2005, but that clearly did not mean there was no role for the federal government in the market. Some of the experts I spoke with pointed out, that there’s real dangers in a market that lacks outside verification, backing, and the kind of expert oversight that a USDA could provide. Here’s Dr. Hanna Breetz from Arizona State University with one example.

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Hanna Breetz: So, what's driving demand for ag carbon market? If you end up with people saying, “Oh, this is great.” And we're going to have super, super high goals of how many credits we want to buy. And the goals for how much credit they want to buy is like way too inflated and difficult to achieve then I can almost guarantee you that you're going to end up with people, redefining what a credit is and finding some loophole and finding some way to earn credits that are actually meaningless. And so, you want there to be ambitions. You want people to be wanting to buy these carbon credits, but you don't want so many people to want to buy them that you create a meaningless product. And so, you might end up with people just buying a bunch of junky, renewable energy credits that don't really represent very much.

Sarah Mock: Maintaining not only the actual quality of ag carbon credits, but also their perceived quality, is no small task, and there is a lot of attention being paid to whether this work by USDA is more of an asset or a risk. I spoke with Mitchell Hora on this topic, he’s the founder and CEO of Continuum Ag, a soil health data company.

Michell is one of the young, scrappy entrepreneurs who is out in the world, trying to help bring carbon markets to life in a way that makes sense. He’s optimistic, but cautiously so, about the role of policy in ag carbon markets, he’s even more cautious about the long-term risks.

Mitchell Hora: The biggest thing over the next five years is going to be, what's going to happen from a federal policy standard. Which is either going to enable these free-market systems to really thrive and really succeed and can be great, or a federal policy can screw it all up and it all just goes away. And it is an enabling for at least for soil to be part of the solution, and for row crop farmers to be part of the solution, so. However, there's so much money going into it and so much push behind this that I think that there's going to be something there. At least in the next five years. But my concern then for longer-term is if we're not going to focus on the real carbon draw-down and the real footprint, and we're only going to look at checking the box for change of practices. Then when we go in five and 10 and 20 years to measure, are we actually getting the carbon sequestered that we claim to be? If at that point, then the claims are not holding up to all the dollars that have been invested, now the buyers of all these credits and all of the hundreds of millions of dollars being put into this space that money's not going to be happy. And those companies are not going to be happy. And they're going to be saying, “We put in all this money into sequestering carbon and offsetting our carbon footprint” - yeah, there was more farms that added cover crops, there's more farms that did no-till, but did that actually sequester carbon? Did that actually get us a net benefit at the end of the day? Pulling carbon from being a gas in the atmosphere to, into somewhat of a, you know, supposedly solid in the soil did that actually happen? That would be my concern.

Again, I think that's back to policy and science and, the innovation that we can really deploy today to understand what is my actual carbon footprint? What is my actual drawdown? What are my actual emissions? What is my farm's true impact, more holistically than what we're looking at today? The data's there, is the science all there to be able to back it up and know exactly what that footprint is? No, definitely not. I think that's where policy needs to be at. It’s Iowa State,

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NRCS, and Extension, local farmers – we have a great opportunity to better understand our own impact.

Sarah Mock: To Mitchell, the equation should be simple, if a farm is sequestering carbon, they should be eligible for payments, and if they aren't, they shouldn't get paid.

Mitchell Hora: I don't know if the farm should get directly penalized. I don't want that. I don't want there to be a carbon tax. I don't think that we should have the stick. I think it still needs to be a carrot, but we need to understand that farm's true impact. And if they're offsetting somebody else's footprint, then they should be able to connect in and be able to set up those market systems to help each other.

Sarah Mock: I think it's safe to say at this point that there are a lot of unanswered questions in ag carbon markets - not just in how they'll work and what technology they need to operate effectively, but also in terms of what their goals actually are, and whether their current structure actually lends itself to accomplishing them. Maybe, then, it's a good thing that policymakers aren't rushing too quickly into the fray, given that aside from all these unknowns in the how the markets will function, there are also the perennial policy unknowns - who will win and who will lose? How big will the deadweight losses be? How might the policy affect existing economic inequalities? And how can policy help ensure the market's goals are accomplished, and that it isn't co-opted by vested interests?

The biggest takeaway I think, when comparing current ag carbon market policy with previous biofuels policies, is that in the absence of a government mandate requiring a certain level of participation, these markets are unlikely to see significant or consistent growth, especially when companies interested in this work, have the option to fund similar projects overseas for a fraction of the price.

For now, we'll leave our guesswork about the future of carbon policy behind, and continue on with our ethanol journey, picking up where Mitchell left us moments ago, wondering about how farmers can participate in, and benefit from, this potentially lucrative new market.

Not today's but the one that was blossoming in the wake of the 2005 RFS. During the immediate pre- and post-RFS years, when American corn and ethanol were just on the cusp of a once in a generation boom, some farmers were already thinking about how they might invest in turning their commodity crops into a higher value product, while at the same time, creating some new jobs in their rural community. Many of these entrepreneurial farmers were making their own plans, and raising their own funds, to try their hand in the energy sector.

Kerry Rose: In the beginning we thought we would be a farmer owned, you know, all along. We were assured once is our project is feasible, the money's going to come because the money wants to be in ethanol, and we would get to select kind of who we wanted.

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Sarah Mock: Did it work out like that?

Kerry Rose: Well, we didn't get a plant built.”

Sarah Mock: How to build an ethanol plant, or not. But that’s next time when Corn Saves America.

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