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Corn Saves America

Episode 5 – If You Build It, They Will Come

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

If you want to get a flavor for just how big of a deal the U.S. ethanol market was in the 2000s, post-RFS,
Here’s Brent:

Brent Gloy: I was at a conference. I think it was in Aims, and the subject was renewable fuels, and it was a huge meeting. I mean, there are people everywhere and everybody was trying to figure out how to get into the industry. And I got in the elevator, and I look over and I look at this guy, I'm like, Vinod Khosla, who is a billionaire. He was partner, I think, at Kleiner Perkins and then had started his own VC fund. He’s just a slight guy and I don't even think he had a bodyguard with him - he was going to give the keynote address at that meeting. And I'm like, “Wow, it's an interesting world in agriculture now, when you have these billionaire investors coming to talk to a conference of basically farmers.”

Sarah Mock: This isn’t the first we’ve heard about the big names and big money from well outside of the ag space, that were planning to jump into the new biofuels sector. But it’s worth pointing out that prior to the RFS, the biofuels space was populated by a lot of people in agriculture, especially farmers.

For a lot of those farmers, in fact, their interest in ethanol was not about the Next Big Deal or “hockey stick” returns, it was about investing in their small towns and rural economies, and perhaps more importantly, creating new markets for their products. See the thinking was, ethanol gave farmers, and by proxy their communities, a way out of the seemingly tapped out food and feed market - an entree into a much bigger, and much more unquenchable customer base. The market for gasoline. Even before RFS 1 and 2 were signed, some farmers were starting to think about how they could strategically invest in ethanol. Though most of them wouldn’t describe it that way. I found one of these farmer-investors, his name is Kerry.

Tell me like, who are you?

Kerry Rose: I'm just an old farmer. Anything else? So, I'm down in Southwest, Missouri, just a little bit across the line from Kansas, just a little up from Arkansas, two hours south of Kansas City.

Sarah Mock: Kerry farms with his dad and brother, though they have separate operations, and he raises mostly irrigated grain. But for most of his career, he’s also been interested in investing

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beyond the farm. He first got involved in an ethanol plant project in the early 2000s with a couple of local guys he knew.

Kerry Rose: The two founders, actually one was a farmer in this area, big farmer and had a lot of cattle. And his cousin was a retired businessman from up Kansas City-area. He'd come down to visit and just think, you know, "Boy it would be nice to do something, you know, job-wise, industry-wise." And he'd come up with some ideas and they'd talk about it, and nothing seemed to be a fit. And then he got to reading about, you know, ethanol and this would have probably been about 2003. And so, they talked about it, and that kind of seemed interesting. And, so they did a little more research and talk and then it got a little more serious and I got pulled in and along with a couple other guys. And that would have been about 03, when we first started looking into it and we weren't really looking at ethanol. Our goal was two things – a market for our corn, mainly, because we were all crop farmers. We were stuck in the \$2 corn era, and we wanted to market for our corn and, and some economic boost for the area too.

Sarah Mock: Kerry and the team started in with more research, and eventually got connect to someone from the Missouri Corn Growers, an expert who'd been involved with other plants in the state. He helped them develop a business plan and then commission a feasibility study to determine what kind of plant the area could support.

Kerry Rose: And we were still thinking very small and very local. We were thinking a 20-million-gallon plant, 10, if we could. Just because our goal wasn't anything really grand. And a couple of the guys in our group was, was big cattle operators also. And one of the distillers' grains that was, that was a big plus for them, as much as they wanted the corn market, they wanted to buy distillers' grains right next door and usually really cheap back at that time.

Sarah Mock: I'll pause just for a beat to acknowledge that, cattle producers who were enthusiastic about the coming of ethanol were something of a rarity in those days. We'll talk more about the ethanol/feed fissure and the work of elevating distillers' grains in a bit, but that Kerry's project had the support of local cattle operators was a big deal. The next logistical hurdle to clear? Where to locate the plant.

Kerry Rose: First you start, where can you put it? You've got to be by a railroad and a big powerline and a road access. And so, the infrastructure more than anything that dictated the location. And just up the road, there was a group that was building a soybean crush plant and a biodiesel plant. And they had been struggling for a long time to get it going, raising money. And we talked to them quite a bit and they were starting to build or getting close to it at that time. So, we talked to them a lot too, and it was actually looking at, maybe, coming in beside them because they had a lot of land and, you know, we all thought that would be a pretty neat thing to be able to have a soybean and a corn plant in the same area.

But that was going to be too much congestion. It really - there was enough room to put them, it wasn't enough rail. And then you get into the air permit. They were concerned about our

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operation impacting them. So, we went looking for another site and found one, not - we wanted in our county, and specifically our little town and we ended up, had to expand our area quite a bit. To find a spot and they would support it. And we ended up to the county north of us.

Sarah Mock: Once they had their location, they hired ethanol developers to lead them through the process, and discovered it was much more involved than they anticipated. There were a lot of regulatory hoops to jump through, many permits to acquire, railroads to connect, and ethanol marketers to build relationships with.

So, they organized an LLC and started to raise some money to get started.

Kerry Rose: That would have been probably in 04, 05 - just as the RFS was getting signed. I believe that was in 05, the Renewable Fuel Standard, and so, we had met, for a couple of years, “Are we going to do it?” And then, when there was talk of the Renewable Fuel Standard, that's when, you know, things really started picking up and then, yeah, we wanted one and, and the industry wanted us to have one.

Sarah Mock: Spoiler alert. This is not the Cinderella story of a group of farmers hoping to sell their corn and support their community, that come into the sector at precisely the right moment to take advantage of an ethanol market that would enrich them all. Because despite Kerry's group wanting a plant, the government wanting more ethanol, and plenty of financiers hungry for the big returns building a plant could offer, what had initially seemed like good timing had in fact become a little too good.

Kerry Rose: We was, in the beginning. Yeah, we knew, we thought we would be a farmer-owned all along. We were going to raise money from other farmer investors and with borrow, you know, a big, a good chunk also. We were assured once is our project is feasible, the money's going to come because the money wants to be an ethanol, and we would get to select kind of who we wanted.

Sarah Mock: Yeah. Did it work out like that?

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

Sarah Mock: To understand why Kerry's group didn't end up getting their project across the finish line, we have to understand how extreme the rush of interest, money, and new players into the ethanol space really was.

Kerry Rose: So yeah, they were interested, but we, after 05 that's when things, the whole industry just really exploded. We were making, in the country, I don't know, a couple billion gallons of ethanol and all of a sudden government says, “Hey, we want 15 billion.” And where's it going to come from? And we got cheap corn. We got high, high gas. This isn't too many years after 9/11, renewable fuels - everything was sexy about ethanol at that time, homegrown, anti-

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OPAC, renewable fuels. And then you've got the RFS saying, "Yeah, here's how much we want."

Sarah Mock: It's not easy to capture what the industry was like during the RFS expansion years, but Kerry captures a little bit of that mania in this story about an ethanol meeting he used to attend.

Kerry Rose: So, they have, for several years. I mean, going back to the gasohol days of, the 70s and 80s, they had a seminar called "The Fuel Ethanol Workshop." Probably back then, you know, there was 20 guys getting together and talking about it. And then it got a little bigger, you know, to maybe a few hundred in 04. And then when that 05, and the RFS, we went to we were fully up and running as a company in a developing company in 06, when the fuel ethanol workshop was held in Milwaukee and four of our board, we went up there and just, I still am blown away at what a big deal it was. It was a big convention center where they used to get a few hundred people. Now they had 3-4,000 exhibitors from all over the country, and the world, selling their part of the ethanol. And it was just unbelievable - the excitement. And we were needing to meet with all the people that you need, helping you build a plant and there are all those vendors are, they're looking for us. We wanted to take them out to eat. They wanted to take us out. But everybody had a list - there's not enough time to get everybody together. It was just unbelievable. The excitement and the steaks were flowing freely. Literally, it was high times in the ethanol industry. I went for a couple more years, and it was just as big the next year, but right after that. I mean, during that, the industry changed.

Sarah Mock: In the pre-RFS times, Kerry says, the people attending these meetings, and who were participating in the ethanol space in general, were real true believers - people who thought ethanol could be a real, full-scale environmentally friendly alternative to gasoline. The RFS changed that.

Kerry Rose: But at these workshops it was really people that were really into ethanol. A lot of the providers, the people that build them, but then some of the ingredients, they wanted ethanol for whatever reason, maybe just cause that's their business. But some of them were real believers in the whole ethanol movement. After that, it was just people following the money. Hey, that's where money's to be made.

Sarah Mock: The changes that were happening in the industry were working directly against Kerry's team's plan. They wanted a small plant, remember, just a little local spot that nearby farmers could supply, and local folks could work at. But the industry, flush with investor cash and the promise of guaranteed demand, was no longer interested in small plants.

Kerry Rose: So instead of maybe a 15 or a 20-25 million, 50 million was the bottom, the entry level plant, and then before long it was 100 million. And we were told, "Hey, that's what they're building, you've got to look at that." And we did push back hard and said, "We cannot do that" - that's too much money and plus we don't have enough corn in the area, that's going to change

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everything. So, reluctantly, people in the industry would still talk to us about the 50-million-gallon plant. But we're just in a matter of months, six months, maybe it went to, you have got to do 100 and nobody will talk to you. And then, the prices, of course, went up.

It had been a real, small, tight group of people in the industry. There were just two or three companies that built them. Some of them build them and would come in as your partner and build it, and then manage it, and run it. Some of them just build it and then move on to the next one. But the few that did it already had two or three in the works or lined up. And so, that was a scramble, trying to find somebody to build a plant, when there's a lot of people capable, but they hadn't actually built ethanol plants. You know, they might've built a distillery for a beer company or something, but it was a matter of you couldn't get materials, you couldn't get builders. The prices were going up. We went from, I think, just maybe a little over a dollar a gallon to build a plant to up towards \$2 to build a plant.

But at the same time, ethanol went from, you know, a buck - buck and a half to \$4. You've got to understand how much money, the plants that were up and running were making - because they still had cheap corn. They were in some less than \$3 corn and ethanol price, more than \$2-\$3.

Sarah Mock: There were certainly some big opportunities in the blooming ethanol market, but there were also big risks, and longtime horizons to getting a plant up and running. By 2006, things were getting serious. The group needed to start spending real money if they wanted the project off the ground. They'd raised something like a million dollars from seed investors, a significant amount just to cover the legal costs of doing a public offering. Then, they needed an air permit, and the demands just kept piling up.

Kerry Rose: And it was unsettling for us - you have to push forward with. I don't know, four or five, six or seven different things all at once. Whereas normally I would much prefer to - you do one, just check it off and then you move to the next one. But with all these different things needing done, you got to move simultaneously with all of them, or you'll never get them all done. And time was definitely of the essence and that's where we wanted to go as fast as we could because the market was really ripe. But everybody was just so busy, there was people all over the country wanting to build plants, not just farmer groups, but just people with money, it was, investment people - the big ADM, Cargill, people like that, that already had a plant or two or three, but they wanted more. Oil companies wanted to be involved in it since they were going to be using more ethanol, they wanted to control the supply chain. That's one thing about them. They're pretty well vertically integrated from the oil pump in the oil field, to the gas pump at the station and relying on a farmer plant over in Missouri, it makes them a little nervous, so they just like to own the plant themselves.

So, they're competing for resources and there's just wasn't enough people to get everybody handled. Plus, like with the air permit, it took a lot of work. The firm that we hired to help us apply for it, took a lot of work and they were, had many clients calling all the time, but then you submit it to the state and the state was behind on the review everything.

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And in the process of that, everything got so expensive, too. For the amount of money, we were to start with maybe raising 30 or 40 million total, up to 80 million - it just, well it got doubled. What we thought we was going to be, kind of doubled.

Sarah Mock: In about 2007, an uptick in the price of corn had already slightly diminished the enormous profits for ethanol plants, just as the group finally got their prospectus approved, and they went on the road to raise additional funds. Kerry came in as a full-time interim manager to coordinate the group's efforts, so, he farmed out his own farming operation to work on this full time, but this initial rise in corn prices was just the first whisper of a coming storm of changes.

Kerry Rose: In 04 or 05 and 06, everybody wants ethanol. It's a good thing. All of a sudden, we move into the food versus fuel debate. And then, cellulosic ethanol - let's don't use corn, let's use corn stover, or stocks, or cobs, or switchgrass.

So, we're still trying to work our original plan and the industry is already added on, "Hey, if you're building, if you already got a plant, you're looking to put on a cellulosic component to your plant, so you can make it a little of that too." And so, that's, where the industry wants us to do is go ahead and design that in.

Sarah Mock: We haven't really talked about the cellulosic and advanced biofuels components of the RFS, and don't worry, we will spend a whole episode getting into that space, but for now, what you need to know is that RFS 2 added a requirement that, of those 36 billion gallons that refiners had to blend, more than half needed to come from a non-starch, or non-corn, feedstock.

Kerry Rose: And so, all of a sudden, corn ethanol is not quite as good as it used to be, but we want it out of something else. And so that really complicated things that, had to put our foot down on that. The technology wasn't there. That was a big difference on that. The technology for ethanol from corn had pretty well been perfected from the past 20 years, but it was brand new for making it out of cellulose. And there wasn't any full-scale production going on. And then you throw in, the housing crisis of 08 by then corn prices are quite a bit higher. We're up to probably had hit \$4 corn by then. And the industry slowed down a lot.

And we were, we had everything lined up. We had our site found, we did a, a soil survey. It was a good site. We had an air permit; we had talked to the electric company and the railroads. We were ready to build all we needed was money. And so, with the industry and the sentiments about kind of ethanol in general, changing a little, and with the banking crisis, it was going to be really hard to get a lone. We were told three years earlier, "If you build your plant, they're going to come to you." And now, you might need to raise a little more money than you thought, you know, instead of 25% equity, you might need 50."

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Sarah Mock: By 2008, it seemed like the tides were turning against the project, but with so much sunk into the idea, there was no turning back. The group couldn't get a meeting with financiers before they'd raised their share of the money, so they went back on the road to have meetings with growers, trying to raise the remainder they needed.

Kerry Rose: So, we went ahead through 08, doing meetings and trying to raise money even though it didn't really seem like it was going to happen. Since we had already seen a big change up and then it changed back down, we didn't know what might happen in a few months. So, we kept pushing ahead. We owed that to our early investors whose money was actually getting spent on the process. And it was easy to do. Cause at the public round, see all of this money went into escrow. So, it wasn't at risk until we raised enough and actually started building the plant.

So, it was easy to tell them, even though it didn't seem real likely that we was going to get enough raised to build our plant. It was easy. It was easy to go out, trying to raise because you tell them, "Hey, you know, if we don't get it enough, you get your money back plus interest."

So, we still spent months doing meetings and it was really hard to get anybody interested.

Sarah Mock: Over just a matter of a couple of years, Kerry and his group watched the ethanol industry go from a backwater, a tiny annual meeting of a few dozen guys, to a bonanza where equipment sellers and builders were turning down customers for being too small. That energy wasn't unfounded either, there really was some incredible returns in ethanol, even if for only a short window of time.

Kerry Rose: At the peak there when ethanol, I forget how high it got, but it was up, I think \$2 or \$3. And you were buying your corn for \$3, and you get, 2.6 or seven gallons of \$3 ethanol. And literally they could pay for a plant in a year, a plant that costs them, \$50, \$60 million.

And they're making no they're making that in a year, but that was a short time. But that was enough to light a fire under everything.

Sarah Mock: These astronomical profits for ethanol obviously created a tremendous new demand for corn, and even for ag experts watching markets at the time, who understood the likely effects of the RFS, it was still shocking.

Here's Brent:

Brent Gloy: I was surprised by the magnitude of the demand shock. I mean, it wasn't hard to figure out like you saw the gallons and you knew how many bushels that would be, but you've got to go back again to the time when that was implemented. And we were in a time of perpetual surpluses and anytime demand would increase supply would just, you know, catch up with it almost immediately. So, I think a lot of us thought it was going to be good, but I didn't realize myself quite the magnitude of how good it was going to be. And how significant it was going to be at the time. Because again, coming from this viewpoint that the supply will pretty quickly

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expand to meet demand. I didn't think it would be, have much of a problem. And I think it hasn't in the long-term. We've pretty easily accounted for ethanol demand. We can produce plenty of bushels and that's not a problem, but in the short-term it was more of a shock than I thought.

Sarah Mock: So much of those high prices and ecstatic demand was fueled by outside investment, the kind of frenzy of capital that follows around the likes of Vinod Khosla. Kerry had his own perception of the investors the RFS attracted.

Kerry Rose: We really never did get to talk to the money people, because at first, they were so busy, they didn't want to talk to us until we were further down the road. And then, at the end, they had all folded-up shop and moved on to something else. And then, it's funny that there was just a magic window of time in there a little bit earlier than us, where money raising come easy. If you were two years before us, it was hard. They struggled for years and some of them couldn't get it. If you were just a year before us - and there was a plant in Missouri that raised \$20 million in a weekend - that would have been, right after the RFS in the late 05 and 06. That was a sweetheart time that, and there were a few plants around that got that done. They just, yeah, the money just showed up in truckloads at their door.

Sarah Mock: Who were those big players, who were able to spend \$20 million in a weekend? A combination of private equity, hedge funds, bankers, and developers, Kerry says, serious players who were ready to write a check, but only for projects that were ready to go.

Brent points out that, these players weren't just there because of the promise of a new technology, or because the price of gasoline was high. They showed up with their check books open, ready to make serious investments, for one reason and one reason only, a federal mandate.

Brent Gloy: I think that's the thing in the ethanol space that a lot of people don't really understand is what the RFS did for corn ethanol is it provided a market so that people could finance it because once you had the mandate, then the banks knew, "Hey, if we build these plants up to a certain extent, stuff's going to be used so we can, you know, we can take the risk of financing, a \$50 million or a \$100-million-dollar project and hope to get paid back."

Sarah Mock: But even many of these well-financed projects, I should say, had a hard time getting in the ethanol boom.

Kerry Rose: The ones that raised it in just a week or so. And I bet it still took them a year and a half to build a plant. So, they didn't get in on the super good times cause it, it didn't last that long, but that was another thing. Everything, all the preliminary work we did took so much longer. It was a long process anyway for everybody, but it was a lot longer for us because everybody got overloaded with projects, but when they understand that it was going to be, at least two years before you're in production, that made them a little more cautious.

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Sarah Mock: That cautiousness among the farmers Kerry and his team were pitching would eventually be the project's downfall. They never did raise all they needed. Other plants did though, including that one in the county next door to Kerry's, that biodiesel plant he mentioned a few minutes ago. Kerry was one of that plant's farmer-investors and was excited to see it come to fruition. He felt that once it was built, it would pay dividends, whether or not it was very lucrative for the farmer-owners.

Kerry Rose: We told ourselves that, though big worry is what if you build the plant, and then it doesn't work? Well, if we built the plant, somebody would run it. If the economy changes and we can't make money, we go bankrupt. Somebody else will come in, buy it for \$0.20 cents on the dollar and it'll make them money. And so, we've still got our market and we've still got our economic impact of jobs in the area.

So that was for a farmer, we were comfortable. We didn't like the idea, but that would have been okay. But that was kind of the worst-case scenario is we get it built and we don't get to run it. Somebody else does that. We we've still got long-term benefits. That would probably be better than, any profit we might make from being a shareholder in the plant.

And that's actually the biodiesel plant. That's what happened to them. They got it built, ahead of us and just up the roadways. And when grain got high, they got their plant built, but they didn't have enough operating capital to buy beans was a real problem. And they ended up having to sell out to ADM, but it's still up there and every bushel bean I raised goes up to them. So, it's still a good market.

Sarah Mock: I want to come back to the question of distillers' grains as well, because as the astronomical profits in ethanol started to slip, the other products coming out of ethanol plants became much more important. And though distillers' grain became a valuable feed product, it wasn't clear at first that that would be the case, especially to livestock producers who, at the beginning, saw ethanol mainly as new competitor for feed corn.

In fact, after the ethanol plant project ended, Kerry actually ended up on staff at the Corn Growers, where his job was to go talk to farmers, and ranchers in particular, about the benefits of distillers' grains.

Kerry Rose: My job was kind of show up at a cattle meeting and take it to them for high price corn and we did several projects where we helped them figure out ways to use the distillers' grain. Because, especially the smaller ones, they might've had it in their feed. If they bought a prepared feed, they'd been using it and didn't know it, but they didn't really know how to utilize it by itself. And so that's what we worked with, getting them access to it. And we did a lot on education there and worked with the Missouri Extension and distributed a lot of distillers' grain to allow them to see how it fit into their operation.

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Sarah Mock: Distillers’ grain was important in helping the ethanol industry get through, at times shining and struggling, through its early years as a mandated market. A lot of research time and money went into developing distillers’ grains as a feedstock for livestock producers and helped to avert some of the tension in the ag industry. But Kerry’s story has illuminated much more - it gives us the broad strokes of what to expect from an agricultural market that if not created by policy, was certainly fueled by one.

Some key notes to keep in mind - what the RFS did to a small and rather niche space was explosive. It attracted new money, new players, and quickly increased the scale of the sector beyond the ability of individual or even groups of farmers to participate, because of their inability to compete against large-scale operators and investors. Not only that, in a relatively short period of time, the “gold rush” for ethanol took radical up and down turns as market forces shifted with the price of corn, demand for oil, and the changing news cycle.

In the end the vast majority of farmers ended up participating in the ethanol market not as part owners of plants, but simply as corn suppliers. The RFS’s mandate increased demand for corn, which increased the price of corn, which was good for their bottom lines. But for farmers who were trying to be part of the ethanol boom, they were pretty easily squeezed out, in many cases by bigger and better funded parties, which largely left farmers unable to access the investment opportunity that could have provided a buffer from swings in corn prices. What might this track record mean for carbon markets?

A hint from Brent:

Brent Gloy: One of the really interesting important parts to understand about ethanol is that all of a sudden, we had tied the farm sector to another sector that was really big.

And in the case of ethanol, it was the energy sector and gasoline in particular, huge, huge market. And the prices in the gasoline market, were going to swamp all the impacts in the ag market – it’s just so much bigger of a market. So, the fact that ethanol prices got high was never going to be enough to dissuade people from driving, because it was a small component of a really large product category.

Just like high wheat prices are never going to prohibit people from eating bread because the wheat is just a small component of the total cost of the loaf of bread. But we tied that ag sector to this huge market and in the case of carbon, it's even bigger potentially. Carbon encompasses all of the fossil fuel industry, the whole energy center, which is massive.

Sarah Mock: What hurdles lay ahead as ag carbon markets aim to launch farmers into a whole new world of customers, partners, and investor interests?
We’ll get into it, after the break.

[[COMMERCIAL]]

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Sarah Mock: It might seem like a bit of a fool’s errand to compare the building of an ethanol plant to the building of ag carbon markets, because in the most obvious sense, you don’t need a 100-million-dollar plant to issues credits certifying that you’ve farmed in a way that keeps more carbon in the ground. The thing is, you kind of do though.

Not a plant, of course, but that hundreds of millions of dollars will be needed to create the systems and technologies that allow carbon markets to work - from the measuring technology to the official verification system.

Why does the verification matter so much? Because in an ag carbon market, the commodity is, as USDA’s Seth Meyer puts it, is a piece of paper, one that’s layered on top of another commodity, like number two yellow corn.

Seth Meyer: Is it number two yellow still? Yeah. It's number two yellow still, but it's number two yellow with this piece of paper that you can't physically see this attribute within the corn, but it's there with this piece of paper. So, is it a different commodity? I might argue it's a different commodity. You're building a market for this commodity, which is number two yellow+.

And, you need to have a legitimate system of tracking and verifying because folks have to have confidence that that piece of paper actually reflects a practice. So, when I think these commercial carbon markets develop, they are incredibly stringent because that's the fear, right? Is that really an extra metric ton of carbon sequestered?

If I put a gallon of corn starch ethanol in front of you and I put a gallon of sugarcane ethanol in front of you - you can't tell the difference. You can't chemically measure the difference between these two things. But they have different certificates associated with them. So, there is some non-physical element to that compliance, and, in the ethanol, you can't tell the difference. You can't tell the difference between that sugarcane ethanol and that corn ethanol, except for the piece of paper that goes with it. So, here I'm telling you, you can't physically tell the difference between that number two yellow and that number two yellow with a piece of paper. But that piece of paper means something as long as you develop a system that says, “I have confidence, that that piece of paper means something.”

Sarah Mock: So how does an ag carbon company create that confidence? Right now, it’s by investing in technologies that increase the certainty that they are sequestering carbon. This investment is largely concentrated in the ag tech startup space. And not unlike the early days of ethanol, there is a lot of energy coalescing around carbon markets. Here’s ag tech investor Connie Bowen.

Connie Bowen: The energy is - the first word that comes to mind is “manic. “Most farmers I've talked to here, kind of like eye-rolling for the most part. But anyone who is like, “You can definitely get paid for doing what you're doing, and you'll get an additional revenue line.” Like people will listen to that and say, “Okay, but show me the fine print though.” So, that's what I'm

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hearing on the farmer side. On the investor side, evaluations are so ridiculously through the roof - everyone is throwing money at something I don't think that they really understand. Don't get me wrong. I want carbon markets to work.

I don't know that most of the technology is focused on measuring soil carbon do it. I don't know yet that everyone is excited about it. And then I'm like least plugged into the corporate side of it, probably. But also, everyone has a program or is partnering with someone for a program. It's almost at the point where financings for tech around measuring soil carbon are more overvalued than financings for like alternative proteins. And that is saying something.

Sarah Mock: Aldyen Donnelly from Nori argues that this manic energy is coming from the lack of regulatory structure and certainty, and the fact that one of the options on the table, specifically the cap-and-trade option – you'll remember it's where the government creates an emission quota. Is likely attracting a class of gold rush-opportunists who otherwise wouldn't have interests in this space.

Aldyen Donnelly: Any new market is the Wild West end of story. Full stop. So, part of it is you just have to get through the stuff that happens in the early stages of any new market.

But the second part of it is - if we're talking about getting ready to trade government allocated emissions quota, where governments are also planning on earning a lot of government revenues from selling emissions quota and governments are planning on leveling the playing field for domestic producers by introducing tariffs on imports - there's a whole bunch of operators attracted to this market. Who won't be attracted to a market that is like the one the market design that I've outlined as having been what's always worked for us in the past. If we shift to government isn't setting price, government, isn't setting up tariffs, government isn't picking solutions then it's a lot less interesting to a lot of the players who would be really, really intrigued by what we're talking about now.

Sarah Mock: There's one more expert who called the current ag carbon marketplace the Wild West, ag tech entrepreneur and farmer himself, Mitchell Hora:

Mitchell Hora: It's been called the Wild West. I don't want to like continue to only call it the Wild West, but it definitely still is. But then, you know, so many companies with their hat in the ring. A new carbon program, now it's been collaborations and buyouts and whatnot that have been on the headlines here recently. Which to me just means, it's companies trying to align and cross collaborate on building out the real solutions.

Sarah Mock: Mitchell has been deep in the ag carbon wilds for a while. He and his company have been involved in several pilot projects and are tied into multiple private projects. He's offering advice to state policy groups and working with consortiums to help establish industry-wide standards, and after all his work, his message on whether these markets were ready yet for farmers was clear.

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Mitchell Hora: As we sit today, the last couple days of August, I'm still saying, "Farmer - don't actually fully enroll in any of the carbon programs as they are today." I think they still need more development. I don't think they're ready yet. I think it's too risky to jump in with the main thing being that the definition of additionality is wrong for row crop agriculture and just for ag overall. And what I mean by that? In carbon markets there's a concept called additionality, which is that you were doing something historically and now you're going to do something new and that changes the carbon footprint. Well, that new thing is good. And of course, we have to do new practices in ag and we need to get, you know, we need to sequester more. We need to adopt more carbon-focused practices. But that isn't necessarily a carbon market that's called cost share. When you're being paid to go from one item to change a couple of practices and check a couple boxes and do the next thing.

Sarah Mock: I don't know about you, but this was a real record scratch moment for me. Changing practices isn't how you create carbon credits? Sure, this is perfectly in line with what we've learned from Aldyen so far, that we need some rigorous and real measurement, but Seth Meyer at USDA, and seemingly much of the emerging ag carbon industry, seems to think that changing practice, or even the continuation of a practice like cover-cropping or conservation tillage, is a good enough proxy for carbon sequestration.

To Mitchell's point here, he's right about cost share as a practice change tool, and about its availability. The USDA has plenty of conservation programs that provide financial incentives to help farmers transition to a number of these practices already but it's worth digging into why practice-as-proxy for carbon sequestration a good system? I'm going to let Mitchell say a bit more about why the science doesn't support it.

Mitchell Hora: In agriculture, your carbon footprints can be different every year. It's not just - here plant an acre of trees and it's going to sequester carbon for 150 years. That's easy way to do additionality and other carbon markets like in forestry, but in ag, it's going to be different every year. Your cover crops are going to be different every year. The vigor of your cash crops can be different every year. Weather is going to change things every year, your carbon footprints can be different all the time. And I think if this is going to be successful, we have to help a farmer to have transparency around how to actually calculate and quantify that farm's real carbon impact.

Sarah Mock: So, what gives? How can ag carbon markets already be in the manic growth stage that ethanol didn't reach until after discussions about a federal mandate were well underway, when no mandatory carbon market is even on the table for discussion? And at least some of the existing markets are selling credits based on dubious assumptions? Remember, we've already seen a large and developed ag carbon market collapse before, in 2009. I asked Mitchell, actually, what he thought about that, and his answer was telling.

Mitchell Hora: It's happening now, which is the buyers weren't buying, what they thought they were buying. And I really think we've got to be more robust. Obviously, I want the buyers, you know, at the table. I see a ton of interest there. You know, it's definitely not a, it's not a demand

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problem. It's a supply problem. But generating the carbon credit on the farm is, it's really tough. It's tough to get through that process. And especially as how they are today. The models and the tools that we're using are just not robust enough quite yet, to be able to really understand that farm's true carbon footprint and true ability to create that credit.

Sarah Mock: For now, Mitchell grants, the responsibility for cleaning up these irregularities in existing carbon markets lies with companies, and perhaps in the future, also with lawmakers. Mitchell is one of those people who is actively working on it. Because the importance of getting this right can't really be overstated.

Mitchell Hora: We've got a lot of innovation to do, I think, at the registries as well. I'm involved in Climate Action Reserve, one of the main soil, carbon registries that wrote some of the rules. And I'm one of two farmers that was on the working group with Climate Action Reserve. And I know that we screwed some of it up. I didn't know it at the time. It was 2019 - really early. I didn't, I definitely did not know, you know exactly what the pros and cons were of some of these systems. And now I see it and now I know we screwed some of it up and we need to change it, and we need to improve upon some of these definitions and methodologies. Because I think what we've seen, you know, is a lot of hype around this. A lot of headlines, a lot of media, a lot of farmer interest – an insane amount of farmer interest. But very little credit is actually being generated very, even fewer dollars being moved. And I worry that that ends up being a lot of over-promising and under-delivering. And I think we have to get some of these systems fixed.

Or else it's going to lose the luster and it could hurt the overall sustainability movement.

Sarah Mock: So why is there such a rush to set up these ag carbon markets if the risks of doing it poorly are so high? Because whichever company is able to create a functional and popular market first will gain a significant first-mover advantage and will likely have the chance to dominate the market for a while, just as the groups who were able to get their ethanol plants online around 2005 scored those incredible profits. But there are also likely to be losers in this race, companies and farmers who become second, third, or fourth movers, with over-priced or under-verified credits that no one will buy.

Who'll win the race? If ethanol teaches us anything, it's that it's probably the best funded who will lead. And the best-funded groups are likely to be those with the strongest connections to outside financing - think venture capital, hedge funds, and private equity - groups who are not interested in ag carbon markets because they care about farm profitability or environmental outcomes, but who are simply looking to maximize returns.

In the meantime, where's the short-term money in carbon markets headed? Largely, into companies that are starting at the heart of the verification questions, those looking to measure the amount of carbon in soil.

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Connie Bowen has been looking closely at, and investing in, this measurement question, and has seen a lot of companies and technologies that propose to tackle it. This is a tough nut to crack. She says lab soil testing might be the gold standard, but it is very expensive and time consuming, and she doesn't expect it could be the scientific backbone of a large ag carbon market, so she's been looking farther afield.

Connie Bowen: I have spent more than one late night sifting soil and conducting soil tests myself and sticking slurries in the milkshake machine or whatever that acronym is that American Engineering-whatever protocol is. So, I actually kind of understand how this works. So, I will broadly blanket hyperspectral kind of technology for soil testing. And I don't think it will work. And I always started whenever I talked to an entrepreneur who is trying to get money from me for that, I kind of started the conversation with, "I don't think that this will work."

Sarah Mock: Hyperspectral testing, for context, is the practice of using aerial imagery, either from a plane or a satellite, to analyze landscapes using the electromagnetic spectrum. In other words, a camera looks at the landscape, and makes visible all the wavelengths of light, including those that aren't visible to the human eye, which can help us detect material, objects, and even chemical makeup, like soil carbon, in each pixel of an image.

Connie Bowen: I think that the cost of ground-truthing. And by that, I mean, like if you're going to correlate satellite imagery with actual soil core test results, you have to ground truth and actually take those cores, those samples too, and that's expensive. But generally speaking, too, the other piece that I try to look at that I don't think a lot of people, it feels like are looking at, at least on the tech investor side is if we're talking about net carbon dioxide or carbon equivalent emissions change on farm. I think the answer is atmospheric period. But if you're looking at measuring soil carbon, which there is still probably a need to do and if you're looking at measuring other nutrients in the soil, I'm thinking a lot about what is most likely to be adopted by farmers, like from a behavioral standpoint. And so, I'm always asking kind of companies how they're thinking about that, because I think that a physical test - a cheap on-site physical test is the answer.

Sarah Mock: On this question, of figuring out the technology of measuring soil carbon, which will be key to eventually being able to sell reliable carbon credits, Connie is optimistic. She thinks companies that measure carbon emissions and sequestration will have the chance to exit the market successfully, through acquisition, most likely, in the near future. But when she thinks about the timeline for ag carbon markets themselves to be operating at a significant enough scale that most farmer could participate and more importantly, make money, that's much further off still.

Connie Bowen: If I'm thinking more about like my grandma's farm, right. I am not relying on getting paid for carbon sequestration in the U.S. unless I take part in a pilot that guarantees upfront payment, which I might know how to access personally, but like the average Joe, isn't going to be able to, I think, rely on getting payments for carbon in the next decade, for sure.

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Maybe some sort of upfront things for like really venture-backed things that are, that have like a ton of money just to kind of give out and get people on board. But I don't think you'll have market stabilization. Gosh, I don't even know. I don't think it happens until you have taxes, unfortunately.

Sarah Mock: That's right. Connie doesn't think ag carbon markets will be a secure and reliable place for farmers to participate and sell carbon credits year after year, until there is some kind of regulation - a mandate or a tax. Until then, she says, without a guarantee from a company that can afford to take major losses, if a farmer is aiming to create carbon credits - her advice is, don't bank on selling them profitably.

There's one more element I want to talk about that bares striking similarities between ag carbon markets and ethanol - the question of scale. Kerry's group aimed to benefit from a small ethanol project, remember, but were forced, forgive me, to get big or get out. Ag carbon markets today also have a widely publicized scale issue, with, for example, markets like Nori requiring farmers to enroll 1,000 acres or more to participate. The average size of the U.S. farm is well below that figure, meaning that only big farms, and big commodity grain and livestock farms at that, are likely able to participate in these markets. Here's Jeanne Merrill again from the California Climate and Agriculture Network, speaking at that recent House ag hearing about the scale limitations of existing ag carbon markets

Jeanne Merrill: For most small and mid-scale producers' entry into the carbon market, whether it's the California version or the voluntary market, doesn't make a lot of economic sense because of those high transaction costs of developing projects, of having been verified. It's just proved a very complex and ineffective way to deliver the resources that we need to deliver that both help farmers to reduce their greenhouse gas emissions and increase carbon sinks, but also to become more resilient.

Sarah Mock: Lawmakers at the hearing expressed concerns about the fact that small and even some mid-sized farms are likely to be excluded from participating in voluntary carbon markets, due to low carbon prices and high transaction costs, and that even for mid-sized farms who can participate, these markets may only be economically feasible for the very largest. But no meaningful solutions were discussed, beyond the vague recommendation that if USDA could somehow lower the transaction costs, maybe it would be possible to bring smaller farmers into the fold.

I'm running short on time today, so I'll keep this wrap up quick. What have we learned about the growth of ethanol production that might offer some insights on the growth of ag carbon markets?

For me, the biggest takeaway from Kerry's story and from what we've learned about the current buildup of ag carbon markets is that we need to be extremely cautious of manic, goldrush energy

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- like the kind we see today around ag carbon. For ethanol, this energy signaled the presence of interest and money, not from true believers, but from prospectors, motivated not by a desire to be part of building a future for the farm sector, but by a desire to get returns while the “gettins’ good,” and then get out.

It would be foolish to expect that these actors would have the best interests of farmers at heart, or that they would sacrifice their own short-term profits to support farmers or protect the long-term viability of a market. Remember, for the company that runs an ag carbon market, their profit is based on how much of each carbon credit sold they get to keep, not on how much they pass on to their farmer suppliers. And as current ag carbon markets are show some similarities to the run up to the 2009 ag carbon market collapse, then it makes sense that these companies would be focused on limiting their exposure to the downside of this market and selling as many credits as they can in the meantime.

A final note, I think what we’ve learned about distillers’ grains and ethanol is also something to keep in mind. The lesson there - there’s no way to change an incentive in agriculture without affecting others crop users in agriculture and beyond. Whether it’s land use changes, tillage practices, or crop rotations – whatever is shifting, if these adaptations happen on a large enough scale to effect say commodity prices or availability, then the people who buy those commodities will be affected and might have a good reason to mobilize against the change.

I asked Kerry, at the end of our conversation about what he thinks about carbon markets as an opportunity for farmers, after his experiences with the ethanol plant. To him, after a career of risk taking and staying attuned to the next big thing – he, well, is a skeptic.

Kerry Rose: I don't think there's a lot to it. It might be where things go. I'm not following it too closely because I'm not that interested.

Definitely, I don't think it makes sense. You're still doing a short term whatever - it can be undone, down the road. So, I don't think that makes a lot of sense. And then economically and I don't really know what kind of dollars, you know, they're getting thrown around there now, but before, oh, you know, several years ago when it was a hot topic in farm magazines and you know, a lot of guys are, “Yeah. It's a new revenue stream. I'm going to add to my farm.” And so, you're talking, a buck and a half an acre or something – like, that's not going to change my life. And I want to tie myself down to some sort of oversight and regulation for, a very small amount? yeah, that don't make sense to me.

Sarah Mock: His comments raised a question in my mind. What if the money doesn’t come? Or worse, what if it comes, and then stops, like it did when ethanol hit the blend wall?

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

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