Intro/Outro:

Hello, and welcome to this special episode of Field, Lab, Earth. Where we're focusing in on practical transitions from conventional to organic farming. This episode is part of a four part podcast miniseries, with a five part companion webinar series, and is hosted by Dr. Erin Silva, an assistant professor in the Department of Plant Pathology at the University if Wisconsin Madison. You can find more information about these series and related resources, as well as how to get continuing education units for listening, in our show notes or on our website, FieldLabEarth.libsyn.com. That's Libsyn, spelled L-I-B-S-Y-N.

Intro/Outro:

Today's topic is nutrient cycling. Our regular programming will resume on March 4th with a special two part episode. Thank you to NCR SARE, the North Central Region Sustainable Agriculture Research and Education Program, for their support of this episode. Let's talk about farming.

Chris Boomsma:

Hello everyone, and welcome to our podcast once again on the organic transition, I'm Chris Boomsma, director of education at the American Society of Agronomy. And it's my privilege to be the moderator today. Because our guest who is traditionally the moderator is Erin Silva, and she is going to bring us some sound advice here on our last podcast in this series. She's going to focus a bit on nutrient cycling in organic systems, talk a lot about that topic, and then maybe offer up a few comments to finish up this podcast series on the organic transition. So Erin, welcome, thanks for coming back, and thanks for being our presenter today.

Erin Silva:

Thank you, I'm thrilled to be the guest today.

Chris Boomsma:

All right, so let's just jump right on in and discuss the topic, and that is your Agronomy Journal publication that you had with your colleagues on nutrient cycling in organic field crops in Canada and the US. Can you tell us a bit more about that publication and what folks can learn from it?

Erin Silva:

Sure. That publication was a result of about a year long effort with several other researchers specializing in organic systems from across the US and even Canada, so it really has a North American scope. And the purpose of that publication, and what the group wanted to do, was to dive deeper into the research concerning nutrient cycling specifically in organic field crops. Because soil fertility is one of the top concerns and challenges for farmers transitioning to organic production, and often continues to be a challenge once a farmer becomes certified.

Chris Boomsma:

So why is managing soil fertility so challenging for new organic farmers?

Erin Silva:

Well, in both the US and Canada, organic farming is regulated at a federal level. And there's different certification programs applied in each country, and there's some differences and some slight

modifications in regulations in each specific country, but there's a lot of overarching themes within the regulations as well. So overall, the standards in both the US and Canada include specific regulations with respect to soil management. So overall, and this is not just North America, this is really globally as well, organic regulations emphasize soil biological, physical, and chemical properties. So essentially emphasizing aspects of soil health and quality. And the farmer must maintain soil health and quality in this soil biological, physical, and chemical properties through appropriate tillage, rotations, and cover crop practices.

Erin Silva:

So the regulation itself, it really has a lot of emphasis on soil fertility, and the practices that a farmer must engage in to ensure that they're achieving their soil fertility goals within the framework of the organic regulations. So within this framework, synthetic fertility inputs are prohibited, so they can't use what they might have traditionally used or had historically used in their conventional crop rotation practices, but they can use other inputs. They can use cover crops and animal and plant derived inputs to ensure that their crops can access the fertility they need for crop growth and productivity.

Chris Boomsma:

So how did the team of researchers approach summarizing the large body of research out there related to organic soil fertility? Sounds like quite the effort.

Erin Silva:

It was, it really was an undertaking led by Pat Carr from Montana State University, who was really a great leader of this, this very diverse group who are geographically dispersed from all over North America. So like I mentioned, they were from Canada, and New England, and the southeastern US, and the Corn Belt, and the west coast. So spanning a large, diverse set of environments and cropping systems so that the review articles focuses on organic grain, but we're talking organic grain from corn, and soybeans, and cereal grains, from dry land cropping systems, to more humid and temperate cropping systems.

Erin Silva:

So looking at this diverse range of environments, and the research that was conducted on these diverse ranges of environments, the group uses traditional research tools like searching databases, and looking at other reviews of published literature, but also relying on professional contacts and our own personal experience with organic farming to access additional literature. So a lot of effort trying to really compile all the studies that have been conducted looking at soil fertility, specifically related to research conducted on certified organic lands.

Chris Boomsma:

Gotcha. Now I know we want to talk a little bit about the trends of what were discovered, but before I do so, did you folks regionalize the information that you found, or is it a big synthesis across North America? How did you break it all down when you have that massive amount of information staring you in the face?

Erin Silva:

Yeah, indeed we did break it down by different regions. So if you go to the Review article and read the synthesis of the literature, it is divided up by the different regions, and the research is synthesized in summary in a regionally specific way. So there also is some comments on overall trends and research directions, but also looking at more trends on a regional level that reflects more of the specific cropping systems and environments that are represented across the US and Canada.

Chris Boomsma:

Okay, so what are some of the trends that were discovered and that you talk about in this paper?

Erin Silva:

It was interesting to see, as someone that works very closely with organic farmers and hears about their experiences and their observations, not only with my work here in Wisconsin where I'm based at the University of Wisconsin Madison, but from my work traveling across the US, it was interesting to see how these farmer observations aligned with what was emerging from these various research efforts.

Erin Silva:

So one of the findings, we look at the northeast and mid Atlantic region, and the upper Midwest, many of the row crops that are grown in these regions are grown in operations that include livestock, so this is different than when we look at the grain production regions in Montana or the Dakotas, where it's more focused on cereal grains. When we're looking at corn and soybean amid the northeast and again the mid Atlantic region and the upper Midwest, they're often grown on the same farms that are producing our organic milk, or organic meat. So looking at how farmers manage these row crops, they certainly have more options, because manure is more readily accessible.

Erin Silva:

So as I mentioned, I'm based in Wisconsin, I work in the upper Midwest, and as such I work with a lot of organic dairy farmers. And indeed, these farmers do have ready access to manure, and that certainly does serve as a primary fertility input. But they also, the enormous benefit of farmers producing in these systems and in these regions, are that they often include alfalfa in their rotation. And particularly with respect to managing organic systems and organic fertility, this has enormous advantages. Farmers can derive a significant nitrogen credit from doing two to three years of alfalfa, or any other legume based forage. And even those farms that may not have livestock directly part of the operation, the other organic farmers, other organic grain farmers in these regions also benefit because there is a decent market for organic hay. So conventional farmers that are in these regions, Wisconsin, Iowa, Illinois, Pennsylvania, New York, they have the benefit of being close to organic livestock operations, and being able to include organic hay and alfalfa as part of their rotation. So that's an important thing to consider when you're working with farmers that are interested in transitioning, and maybe more doing a typical organic ... or more of a typical conventional corn, soybean rotation, that in the organic market there is a place for organic hay to go, and farmers, if they're growing good quality hay, can get a decent price for that crop.

Erin Silva:

So that, again, offers a big advantage in terms of getting nitrogen into the system without the tool of synthetic nitrogen, and also has great weed management benefits as well, by having that perennial crop on the fields for two to three years, that not only prevents weed seeds from germinating, but also allows

farmers to essentially cut any weeds that germinate without having to till or disturb the soil. So in those regions, there's definite advantages in terms of being able to engage in organic row crop farming.

Chris Boomsma:

All right, well let's talk a little bit about nitrogen, particularly for those organic grain farmers that don't have access to manure. What are their options for nitrogen fertility? What do you suggest here?

Erin Silva:

Yeah, that definitely is tougher, because certainly when we're looking at organic systems, and accessing nitrogen, and bringing nitrogen to the system, manure is definitely the go-to. And whether that be manure from dairy cattle or beef cattle, or looking at a product from poultry operations that may be dried or pelletized, often there is a animal component, animal origin to that nitrogen. But that product is often expensive and can be hard to ship and hard to access. So farmers that are transitioning to organic production, or currently doing organic production and are in regions like I mentioned in the Dakotas, or Montana, or Nebraska, that may not have kind of that critical mass of livestock operations, I should note though that when we're looking at manure and the integration of manure into organic row crop operations, that manure does not have to be from an organic livestock, or dairy, or poultry operation. Organic farmers can use manure from conventional operations. They do need to check that that manure hasn't received any additives or stabilizers, but the fact that it's from a conventional livestock or poultry operation doesn't necessarily disallow it from being applied to organic fields. So that's something to consider if, again, you're working with a transitioning farmer, or interested in transitioning, and trying to evaluate what your nitrogen sources might be, that conventional livestock operation certainly can be a source or nitrogen for organic row crop farmers.

Erin Silva:

But there are some areas of the country where that still, even on a conventional level, is not necessarily easily accessible. So in these cases, organic grain farmers are typically relying on cover crops as their source of nitrogen fixing legumes. Again, there is a market for organic hay as you get further away from organic livestock operations, the economics are a little bit tougher to work out, but there still is a market. But often these farmers are using cover crops in some way, and nitrogen fix and cover crops to get nitrogen into the system, and either eliminate or at least lower their need for manure as, again, that primary source of nitrogen.

Erin Silva:

So the best opportunities in a rotation, in terms of getting these legume cover crops into the system, typically is either within or just after a cereal grain phase of the rotation. So your one strategy that is commonly used in the upper Midwest is frost seeding legumes into winter wheat. So just as the spring is starting to warm up and you're getting some freeze and thaw in the soil, and getting some cracks on the soil surface as that ground warms up right at daybreak, that's a perfect time to go over that winter wheat field, just broadcast seed some red clover at a fairly low rate, about 10 pounds per acre, 12 pounds per acre. And then that red clover seed is small enough that it falls into those little cracks that, again, happen as that ground starts to thaw out as we enter into the spring season. And it stays low, it germinates and stays low under that winter wheat crop as the winter wheat continues to grow. Farmer comes through, combines the winter wheat, and that cover crop is there and it's ready to take off when it has access to the sunlight, and produces a nice crop to give a nitrogen credit when it's incorporated the following spring.

Erin Silva:

So it's a way that farmers can pretty easily integrate, and in organic rotations typically we are including a cereal grain, and there's a market for organic cereal grains, to get nitrogen into the system and not necessarily have to alter a lot of the cereal grain cropping practices.

Erin Silva:

Another option, because those cereal grains are taken off fairly early in the summer, in late July or early August, we can still come in and plant a legume crop after that, so certain clovers like berseem clover, even planting hairy vetch after that, we can plant sometime in August and still get a good clover cover crop in there. Not only are we suppressing weeds and building soil, but we're getting a decent amount of nitrogen that if we're following that with a corn crop the following spring, we can probably get about half of our end needs from corn satisfied from that cover crop, and potentially even more depending on how much biomass we're able to achieve from that cover crop.

Erin Silva:

So those are typical strategies that a farmer would use. There's other ways beyond cereal grains that farmers create those windows for cover cropping. Here in Wisconsin, farmers will grow green peas for canning, or sweet corn, there's a growing market for field peas, field peas for organic protein in different sorts of products on the organic market. So there's definitely options to create these windows for cover crops if a farmer thinks outside the box, explores different markets, thinks beyond the typical corn, soybean rotation where we're looking at planting in May and harvesting in October, and there's much more limited opportunities for cover cropping.

Erin Silva:

Sometimes in certain regions and in certain areas, depending on the rotation, farmers will spend an entire year just building the soil with cover crops and getting a nitrogen credit by doing some intensive cover crops and taking the year off from cash cropping. So they get, again, the benefits of weed management and soil building, and they find that looking at the economics across the rotation, and the value of that nitrogen, and the value of the other organic management benefits, it's best to put that land into a soil building, fertility building year, and access nitrogen, and build nitrogen in the system that way.

Chris Boomsma:

All right, well you talked about some legumes here with regards to cover crops. How about what are some benefits of non legume cover crops? What are some of your planting options there that you can use to boost soil fertility without turning to, let's say a clover or an alfalfa?

Erin Silva:

Yeah, and cover crops are just such a foundational component of organic practices. To talk more broadly about cover crops, in organic, typically depending on where we are in the crop sequence, there may be a need to do some tillage of the soil to either work down weeds, or prepare the seed bed. And it's not necessarily every year, and it can be shallow tillage, but oftentimes, especially farmers that are transitioning, or crop consultants working with transitioning farmers, they can be really nervous about moving to a system that relies on tillage. But cover crops are often used as that counterbalance to tillage and soil disturbance, so we may be doing tillage, and we may be doing soil disturbance, but typically organic farmers are coming back in as soon as they can and if they're not planting a cash crop into that

ground, they're planting a cover crop. So they're getting that ground covered, they're putting on that soil armor to protect the soil, they put living roots down into the soil to hold soil in place. So in general, cover crops just play such an essential role in achieving those aspects of the regulation I talked about earlier, that an organic farmer has to prioritize and emphasize, again, building the soil biological, physical, and chemical properties and maintain and enhance, improve their soil health and soil quality.

Chris Boomsma:

Yeah.

Erin Silva:

So just from a soil quality aspect, cover crops are so important. But turning around and putting those cover crops in in the fall, they can, those grass cover crops, whether it be cereal rye or winter wheat, there's definitely options out there for farmers even on the later side of the growing season, they can help scavenge any extra nitrogen that may not have been used by the cash crop. So they're not a nitrogen fixing legume, or legume that has associations with rhizobium bacteria that can fix nitrogen in the atmosphere, so they're not bringing nitrogen into the system per se, but they're keeping the nitrogen there that either a farmer has invested in through the growing and purchase of seed and the production cost of cover crops. So with cover crops there's a cost, they're saving the nitrogen that they've produced through the cover crops, or that they've purchased in, again through manure. So cost savings, those cover crops holding the nitrogen in place, and again the environmental benefits of preventing nutrient runoff and leaching.

Erin Silva:

And then those cover crops, once they're reintegrated into the soil the following year and terminated through a variety of means that are available in organic systems, even without the use of herbicides, those nutrients then are available for the cash crop the following season. So cover crops are just so, so critical to the system.

Erin Silva:

Increasingly there is new options, so some really innovative ways that farmers are integrating cover crops both conventionally and organically into the system so that they don't have to wait til corn or soybeans are harvested. So either through aerial applications, or broadcast seeding as the corn or soybeans are drying down, or even planting and interceding fairly early in the corn growth, at about the B5 stage, that gives the cover crop a jump, and the more biomass we get in those cover crops the more nutrients they're able to bring up and sequester, and the more potential benefit they have the following year. And the more potential benefit they have for, again, mitigating issues with leaching or runoff.

Chris Boomsma:

Nice. All right, well hey, you've talked a lot about nitrogen so far. Obviously there's a lot of other macro and micro nutrients we need to worry about, but let's talk about another big one that can sometimes have some negative environmental consequences, what about phosphorous and what did you find in your study?

Erin Silva:

Yeah, that was really interesting. And like I mentioned, it was interesting as we were going through this paper to see how observations by farmers lined up with what was published in the peer reviewed literature, and phosphorous certainly was one of those examples. And again, as we look at where there might be hesitancy or some degree of fear with either farmers thinking of transitioning to organic or crop consultants advising farmers to transition to organic, that using manure as one of the primary sources of fertility in the organic system, that we might be overloading on phosphorous. But interestingly, when we looked at the literature, this certainly wasn't necessarily the case. For instance, in eastern Canada, despite many of the organic grain farms being associated with dairy operations with ample application of manure, so phosphorous tests often came back quite low. And one study for example found that more than two thirds of 20 forage legume grass mixed fields on organic farms in Ontario and Nova Scotia were low in available soil phosphorous. So two thirds, that's a lot of fields that are coming back low in phosphorous.

Chris Boomsma:

Mm-hmm (affirmative), absolutely.

Erin Silva:

Another study found a lack of correlation between soil P indexes and phosphorous soil surpluses, indicating that the soil phosphorous test might not be a good indicator of soil phosphorous status on these organic farms. And again, that's something I've heard organic farmers comment on, not that obviously soil testing is enormously valuable, whether it be conventional or organic, but oftentimes there's a little bit of a disconnect between what's coming back on those soil phosphorous tests and what farmers are observing on their fields.

Chris Boomsma:

Mm-hmm (affirmative). All right, well there has been increase in attention paid to the biological component of soil. You hear that a lot with the whole soil health thing. Obviously the biological component is an important contributor to soil health. How does soil biology play a role in organic fertility management?

Erin Silva:

Yeah, it's again one of those critical pieces of the organic regulation that is specifically called out, that we need to be paying attention to not only the physical and chemical factors in the soil, but the biological component as well. And certainly could be in part due to some of those different observations with respect to phosphorous that we're seeing in organic systems. And I want to take just a quick step back just to emphasize that I'm not saying with this that phosphorous and over application of phosphorous in organic systems is not a concern, it's something that with all farming systems, conventional or organic, farmers need to pay close attention their nutrient management planning, and their nutrient balances, and there can be areas in the country, depending on what the inputs are, for instance some of the areas in the mid Atlantic regions, they do have high concentrations of poultry production and poultry manure, and pelletized poultry manure product is often used as a fertility input. And particularly some of the sensitivities with the watersheds there, there has to be extreme care in terms of organic farms not over applying phosphorous.

Erin Silva:

But the dynamics can be quite different depending on the region and depending on the system, because organic farms are just so unique in terms of how they're able to take advantage of local resources and the environments in which they're farming in. So I just wanted to make sure I was not diminishing the importance of, again, in any farming system to make sure we're not over applying nutrients, because-

Chris Boomsma:

Sure.

Erin Silva:

That certainly can happen in organic as well.

Chris Boomsma:

Absolutely.

Erin Silva:

But in terms of the soil biological component, many of the soil fertility sources used by organic farmers, they rely on soil biological activity to allow for those nutrients to become plant available, to become mineralized. So soil biology is a critical factor, critical aspect of nutrient cycling and the availability of nutrients in organic systems. So there's been studies that have shown that, including some studies that we have done here at the University of Wisconsin Madison, that there's seasonal differences in nitrogen cycling and availability between organic and conventional farming systems. So these nitrogen cycling and availability patterns vary very greatly between organic and conventional grain fields.

Erin Silva:

Which is an important consideration and can be depending on the soil type and the nutrient source, can be a challenge with respect to making sure that nitrogen availability is synchronized with crop demand, particularly again, depending on where a farmer is in the country. It may be easier or harder to find a product that they can side dress and that they could apply in season. So there's some challenges there, and that certainly is an area for future research, and an area where research and crop consultants and farmers can work together to find some solutions that may work in various environments, depending on climate and local input resources, let's say.

Erin Silva:

But there are some differences there that can make that initial transition to organic a bit of a challenge, because of some change in practice and again, just the tools that are available. Typically I would say that as a farmer is farming organically for a longer period of time, and that soil tends to have a larger pool of organic matter and the organic matter that's available for turning over throughout the season, it becomes less of a challenge, but I think it's even more challenging during the transition period before that system is equilibrated, let's say, to account for the organic inputs and for the soil biological community to respond as well. And some of what we're seeing in terms of these different nitrogen cycling and availability patterns would be likely due to not only the organic inputs, certain residue quality can impact the synchronicity between nitrogen mineralization and crop nitrogen need. Which again, is definitely an important factor in managing fertility in organic fields. But certainly the soil biological activity and the changes in soil biological activity can account for some of that as well. And certainly as we've looked at long term organic and conventional trials, and long term trials that have

done side by side comparisons of organic and conventional management, we do often see a divergence in soil microbial communities, and the quantity of soil microorganisms that are in the fields.

Erin Silva:

So there are some different dynamics that are at play in organic and conventional management.

Chris Boomsma:

Right.

Erin Silva:

But yeah, yeah, it's definitely a hot, hot area of research and something I think as we look at agriculture more broadly, whether it be conventional or organic, and we have more emphasis on soil health, that definitely is kind of a next frontier in terms of optimizing our management and optimizing our efficiency of those systems. So yeah, a lot of interesting stuff happening there.

Erin Silva:

And that, like I mentioned with phosphorous, the availability of phosphorous is similarly driven by microbial processes in organic fields, and those microbial processes can impact both the solubilizing of inorganic phosphorous and the mineralizing or organic phosphorous. And several studies that were included in this review paper demonstrated that there are, again, more diverse soil communities under organic management, which could be hypothesized to lead to increased rates of nutrient cycling, and that could be responsible for some of those different phosphorous dynamics that we were talking about earlier.

Erin Silva:

So like I mentioned, we're just at the tip of the iceberg though of this type of research, and understanding, and we see these changes but what does it mean with respect to functionality. But it's really exciting to think about how our deeper understanding of soil biology and management factors can help improve our efficiency and environmental outcomes and crop production outcomes in both organic and conventional systems.

Chris Boomsma:

Absolutely. So let's talk a little bit more about nutrients, and in the sense I want to talk about nutrient management planning. We hear a lot about developing nutrient management plans and the four Rs and all of that. What are some of the biggest challenges with respect to nutrient management planning on organic grain farms in particular?

Erin Silva:

Yeah, so as a crop advisor that's considering or currently working with organic farmers, there's definitely some challenges that you're going to be faced with balancing those fertilizer inputs from a diverse set of materials. Again, whether it be pelletized poultry manure, or feather meal, or manure, or just all the different sources that are out there for farmers to use, and some are more readily plant available and some are more slowly releasing, they have different compositions with respect to nutrients. And again, they're released at different rates, so it's a bit of a puzzle to put all these factors together and come up with a right strategy and right blend that is going to meet crop needs, but fit into the crop rotation and

the windows where those inputs can be applied, that they synchronize with crop demand and that we're not over applying certain nutrients. Because again, there's some fertility sources where you may be primarily wanting to get more nitrogen in the system, but they're also going to be bringing in phosphorous because of the nature of the input.

Erin Silva:

So when we look at both organic and conventional nutrient management planning, overall regardless of the different cropping system, we're taking the approach of balancing the nutrient inputs with the harvest outputs. So again, we look at organic versus conventional, that overall goal and approach is the same, but the difference is really lying in the practices and the strategies that are used to reach those goals. Because again, some of those materials that are allowed in conventional agriculture are prohibited in organic.

Erin Silva:

But organic has a lot of options too, so I certainly don't want people to think that there's limited options, or that we're solely reliant on manure, there certainly are other allowable inputs that fall within the framework of the regulation as well. And we talked a lot about manure and cover crops, but there's other inputs like rock phosphate to get more phosphorous into the system, or potassium sulfate if we need to focus on potassium or sulfur, and there's different allowable micronutrient sources. So there's lots of different options that are out there. Organic farmers can use amendments like gypsum and lime, and we're increasingly seeing the value of compost, not only for the nutrients that the compost may bring, but for the other influences that compost might have on soil biological communities.

Erin Silva:

So a lot of different options out there for farmers, it can be overwhelming though, too, as a farmer, which oftentimes is why they're turning to folks from Extension, or NRCS, or certified crop consultants, because it definitely is a bit of a puzzle, it's a challenge, and there's lots of different options out there. And to try to navigate through all that is ... it definitely takes some knowledge and some know how and some expertise. Yeah, it definitely shows you the value of having these professionals that are knowledgeable and versed in organic to help with putting these different strategies together.

Erin Silva:

It is important when you're working with organic farmers and trying to develop these nutrient management plans that we have these broad categories of allowable materials, but sometimes a specific product might have an additive, or it may be produced in a way that excludes it from being allowed in organic. So it's always important to check with either that farmer certification agency, or there's some other lists and databases out there, the Organic Material Review Institute, for example, that actually evaluate specific products, not from a performance level, but evaluates in terms of ensuring that they are allowed and they don't have any prohibited materials included. And indeed, they would be allowable in organic production.

Erin Silva:

So just always double check when you are purchasing something, or recommending something to a farmer, that indeed that specific product is going to be okay when the inspector comes around and they go through that annual certification process.

Chris Boomsma:

Right. Absolutely. Well hey, I think we're going to pivot off of nutrient management in this discussion here at the very end, because I really appreciate everything you've been doing for this organic transition podcast series, the webinar series that preceded it. Now I was hoping you could finally give us your final words, basically, on the organic transition, any final thoughts you have for the folks out there listening, given all the information we've heard presented up to this point on the organic transition.

Erin Silva:

I do think that there really has not been a better time to explore the transition to organic. Not only do we have the markets that are there looking for organic products, specifically organic grain products, whether it be corn, or soybeans, or cereal grains. But as demonstrated through this review paper, we have more and more research that's coming out to really document the benefits of different organic practices, and more expertise that's available as well. So we definitely need more expertise, there's so much room for farmers to engage in organic and explore getting into organic production and accessing these organic markets. But we need more technical expertise out there.

Erin Silva:

But, the good news is there's more established technical expertise to help, to guide, and train those new folks, whether they be crop consultants, or people in the public sector through Extension or NRCS that are interested in working with these farmers that are interested in transitioning to organic. And I think like we've said in some of the other podcasts, organic is not an all or nothing proposition, there are a lot of farmers that are doing what we call parallel operations, and taking some of their acres and transitioning to organic, which can help not only with the economics of transition, but that learning curve. And strengthening that partnership with the consultant and the farmer to work together to transition part of the farm, and then explore transitioning a larger number of acres if it makes sense for that particular operation.

Erin Silva:

So just want to encourage people too that may be talking to farmers, or working with farmers, that are thinking of transitioning, or exploring organic, that you can do both conventional and organic on the same farm. It does take a little bit more paperwork, and-

Chris Boomsma:

Yeah.

Erin Silva:

A little bit more logistics, but it's very doable, and there is farmers that are doing that very successfully in the US.

Chris Boomsma:

Great insights. We certainly appreciate you being such an expert on this and sharing all this information with us, again, both on the webinar and the podcast, this full series, you've been a great help to many people out there, so-

Erin Silva:

It's my pleasure.

Chris Boomsma:

With that, thanks a lot Erin, appreciate it.

Erin Silva:

Thank you, Chris.

Intro/Outro:

Thank you for listening to Field, Lab, Earth. You'll find links to resources mentioned in this episode, including our webinar series on this topic, in our show notes or on our website. If you have any questions, comments, or recommendations for show topics, please contact us at Podcast@ScienceSocieties.org, or on Twitter, @FieldLabEarth. If you'd like to hear more content like this, please subscribe, and don't forget to rate and review us on Apple Podcasts, or anywhere else you find your podcasts, if you like our show. This podcast is a joint production of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America. Special thanks to Logo Loco for the use of their song, Spook Castle, on the intro and outro of our show. This material is based upon work that is supported by the National Institute of Food and Agriculture, US Department of Agriculture, under award number 2018-38640-28416 through the North Central Region SARE program under project number ENC18-166. USDA is an equal opportunity employer and service provider. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors, and do not necessarily reflect the view of the US Department of Agriculture. Opinions and conclusions expressed by guests are their own, and are not considered as those of the American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, its staff, its members, or its advertisers.