

**PERSPECTIVES ON THE FUTURE OF AGRICULTURE
RESEARCH AND TECHNOLOGY**

HEARING
BEFORE A
SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE
ONE HUNDRED EIGHTEENTH CONGRESS
SECOND SESSION

SPECIAL HEARING
August 15, 2024—WHEATLAND, NORTH DAKOTA

Printed for the use of the Committee on Appropriations



Available via the World Wide Web: <https://www.govinfo.gov>

U.S. GOVERNMENT PUBLISHING OFFICE

60-218 PDF

WASHINGTON : 2025

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PERSPECTIVES ON THE FUTURE OF AGRICULTURE RESEARCH AND TECHNOLOGY

THURSDAY, AUGUST 15, 2024

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:15 a.m. at Grand Farm Innovation Campus, 3729 153rd Avenue, SE, Wheatland, North Dakota, 58079, for a Field Hearing, Hon. John Hoeven (ranking member) presiding.

Present: Senators Hoeven, Boozman, Klobuchar, and Smith.

DEPARTMENT OF AGRICULTURE

STATEMENT OF HON. XOCHITL TORRES SMALL, DEPUTY SECRETARY

OPENING STATEMENT OF SENATOR JOHN HOEVEN

Senator HOEVEN. I would like to call this hearing to order. This is an Ag Field Hearing.

We appreciate all of you being here, very much, and of course the staff that has worked so hard to arrange this formal field hearing. We will thank all of them at the end, which is traditionally how we do it, but there is a lot of folks who worked very hard to make it happen, and we appreciate them very much.

And, of course, we greatly appreciate the incredible people that have come here for this field hearing, and I want to begin by thanking some of them before we go into formal remarks.

Certainly my colleagues from the Senate, who are all absolute leaders in agriculture, and in all aspects of agriculture, whether it is writing the next Farm Bill—writing previous Farm Bills, as well as writing the next Farm Bill, and undoubtedly we will be talking about that today, but really in all things agriculture.

And one of my absolute closest friends in the Senate from Arkansas, Senator John Boozman, who is our Ranking Member on the Ag Committee, and he has been up here before, and not only an esteemed colleague, but also a very good friend, and we certainly appreciate him being here.

And of course, then two Senators that are no strangers to this region, Senator Klobuchar, who I have been working with since Governor days, and I mean it goes almost back to her Attorney General days, but we have worked together on many issues, from flooding to you name it, agriculture and everything else, and she has been very good about working with us on so many important

issues. For example, flood protection for the Red River Valley, very important and meaningful things.

And Senator Tina Smith, same thing, we are working together on veterans issues and many other things. And of course, she is no stranger to this region as well from her time as Lieutenant Governor, working on issues that truly matter, not only to her State of Minnesota, but certainly to North Dakota.

And that is one of the amazing things about this region, we really are a confluence here in the Red River Valley for North Dakota, Minnesota, even South Dakota to Canada, it really is an area where we bring people together and make great things happen, and it is certainly an area where we are absolute leaders in agriculture.

We are also very privileged to have somebody else here who has been here before. And I would love to say about two individuals who have been here before in other capacities as well, and I want to thank them as well right at the outset. Certainly the Honorable Xochitl Torres Small; Xoch is easier for me. I know I never get it quite right.

But going back to her days as Secretary for Rural Development, she has been here and she has helped us on important issues, particularly with our livestock producers, and other areas as well. And she, of course, now is Deputy Secretary of the United States Department of Agriculture. And we know how much in demand you are, and so you are probably coming from somewhere and going somewhere, but we are sure glad you are here today.

And Dr. Chavonda Jacobs-Young, who is the leader of all things research at USDA. And of course that is a big part of the focus, the focus today being the future of agriculture, and precision agriculture and research, of course, are huge when we talk about the future of agriculture; and certainly huge as we write this next Farm Bill.

North Dakota is an Ag powerhouse for this country, and you all know that. Certainly Arkansas and Minnesota are Ag powerhouses as well, and our fellow senators here will talk about that, but they will all acknowledge, too, that North Dakota is an absolute Ag powerhouse. And North Dakota State University has long been one of the leading schools of agriculture, Ag research, Ag extension in the Nation.

And again, you will hear about the University of Minnesota, the University of Arkansas, they do great things in ag too, no question about it, but my colleagues will acknowledge that NDSU, home of the Mighty Bison, I had to add that, is an absolute leader in agriculture, and a big reason why North Dakota is an ag powerhouse for this country, but we are building on that.

And that is why it is so important that our colleagues, my colleagues are here, as well as the leaders at USDA, is because we are really building on what NDSU is already doing. You are here at the Grand Farm, okay, Innovation Shop, this is the Innovation Shop, a multi-million dollar facility at Grand Farm, where they are taking precision agriculture to the next level.

And so now you have got NDSU with all the amazing things they do in research, and precision Ag, and you have got all these amazing companies that we have here in the Valley, and I could start naming them off. Whether it is John Deere, or AGCO, or Case New

Holland, or all the companies, Bobcat, and already, you know, those are all clear leaders in the industry, but there are so many more, right.

And so you have got a confluence of all those things, and now we have put together NDSU, together with Grand Farm, and the Ag Research Service, ARS, at USDA, Department of Ag, into a formal cooperative agreement. We are not just working together. We have a formal collaborative relationship now, which we fund through Ag Appropriations, that is just building on that synergy in regard to precision agriculture, Ag research, and the future of agriculture.

And so this hearing is not just about what we are doing here in the Valley, but how it affects the entire country when we talk about the very best farmers and ranchers that produce the highest quality, lowest cost food supply in the world that benefits every single American, every single day, and many others around the globe as well.

So in addition to that formal alliance, that formal partnership now, between NDSU, Grand Farm, and ARS, now we have also added a National Policy Center that will really be the expert on all things crop insurance, and other very important issues for our farmers and ranchers.

And most recently, in addition to the National Policy Center now, we have the only National Science Foundation innovation engine in the country, focused on agriculture.

Now, there are others, and to the tune of about \$160 million investment by our friends like Secretary Torres Small and others, \$160 million, together with state funding, together with private sector funding, that is just the Federal insurance. This innovation engine, farms innovation engine with the National Science Foundation, again, all things related to the future of agriculture, and it is the only one in the country focused exclusively on agriculture.

So that is what I mean when I say we are building on this incredible foundation that we have in agriculture. And the only way to really build, at least in the North Dakota way of doing it, is you build relationships. You build relationships with really good people like we have here today from all walks of life, public sector, private sector, state, local, Federal, and they benefit. They benefit.

We go into it with the understanding that it is not just about our benefit, that it has to be mutually beneficial. You have got to give a little to get a little, sometimes that gets lost in the political world, but it is fundamentally true for every walk of life.

So again, I want to thank all of you for being here. I do want to start, before I call on the first witness, by just acknowledging some of the statewide elected leaders and legislators that are here, in part, because they are great and doing a great job, but in part because there is a lot of them. And I want people to know, I want people to know that we appreciate, when folks come to our state, we appreciate it, and we show up. And we thank them, and we acknowledge it, and because all of these individuals are working very hard on behalf of agriculture as well.

So it is only fitting that I start with our Ag Commissioner, Doug Goering, and Ag Commissioner Goering, thank you for being here and for all your great work.

Also from our Public Service Commission, somebody who knows agriculture very well, Julie Fedorchak; Julie, where are you?

And from the Senate, also people that get it. Let me introduce from our State Senate, Mark Weber, Bob Erbely, Kathy Hogan, Janne Myrdal, Ron Sorvaag, Terry Wanzek, and Cole Conley. Why don't you guys just stand for a minute or raise your hands?

Senator HOEVEN. And from the House, Paul Thomas. I will have you all stand for a minute at the end here too: Paul Thomas, Jared Hagert, Greg Stemen, Craig Hedlund, Jay Fisher, Bill Tveit, Mike Nathe, Don Vigasaa, Jonathan Warrey, Brandy Pyle, Carrie McLeod, Dick Anderson, Karen Anderson, Cindy Schreiber-Beck, Mike Beltz, Mike Brandenburg, Austen Schauer, and Zac Ista.

Would you stand for just a minute? Thank you.

Senator HOEVEN. Thank you. Okay. With that, we will return to our first group of witnesses. Again, I am so pleased to have them there. We will start with one of our very good friends, just across the river, as I said, somebody who has come up here on a myriad of issues over the years, but who is right now actually second on the Democrat side of the aisle on the Ag Committee.

Senator Stabenow is, of course, the chair. Right next to her is Amy Klobuchar, who will be either the chairman or the ranking member next year, one way or the other. So she has got a big voice when it comes to writing a Farm Bill, and certainly all things agriculture.

Senator Klobuchar.

STATEMENT OF SENATOR AMY KLOBUCHAR

Senator KLOBUCHAR. All right. Thank you so much. Thank you, John. Thank you. Well, I guess I would start by saying, just like I am not competitive, you don't have to stand, but anyone who has lived in Minnesota, worked in Minnesota, does business in Minnesota, or went to school in Minnesota, please wave your hands.

Oh, yeah. Woo. Gophers. Okay, just wanted to point that out.

Okay, John and I have been good friends for a very, very long time, and we believe the river doesn't divide our states, but it brings us together, as you know, with this incredible spirit of our communities when there is flooding, but also the incredible possibilities we have. And this Ag innovation is certainly right at the top of the list, for not only helping our own country, but for feeding the world, and fueling the world. So I couldn't be more happy that he put this together.

I will say this, is the coolest field hearing I have ever been at. Wouldn't you agree? To our esteemed witnesses; complete with this beautiful view, thank you to Grand Farm, this beautiful facility, a rose-colored gavel of some kind, that is, yes, quite cool.

And then, of course, there was the music, which you should know at some point Senator Hoeven said, how do you cut this off so we can start? But I did like the idea of background music through the entire hearing.

When I think about Ag innovation, I think about Norman Borlaug. I was so proud when the State of Iowa actually sponsored his statue for one of their two statues in Statutory Hall a few years back, and I got to be there because, as you know, he studied at the University of Minnesota and did a lot of work in Minnesota.

You think way back zone, he fed the world with what they called then the Green Revolution. He figured out what to do with seeds so things could grow in really hard climates, and it helped us here at home as well.

That was innovation. And we cannot rest on our laurels in America, we cannot do this. I think that we heard this from the Doctor, from one of our esteemed witnesses last night that we can't rest on our laurels. And that is what is so exciting about what is going on in North Dakota, Minnesota, Arkansas, across our country.

Strong research funding is critical for ensuring American farmers can feed the world. You think about the needs if you go to the problems, \$20 billion in crop losses in 2022 alone, from natural disasters, not including infrastructure damage, livestock losses. We know what we have seen with some of the animal diseases out there, including avian flu in poultry, and it affects our food supply across the country, poultry flocks causing a loss of 43 million egg-laying hens in 2022 alone.

I don't want to emphasize the challenges, but no one better knows than farmers what those challenges are. But I also want to emphasize the positives. So Ag research helps us on both sides. It helps us to fix these things, which we know have plagued our country in different ways, over time, whether it is barley rust, whether it was H1N1. I personally ate bacon on national TV to show it was safe at that time. I did that.

But we know that we are going to need this kind of research. It also can be used as a barrier to trade, where countries lift up these barriers that may not be fair, or oftentimes are blatantly not fair, and so having this kind of solution on the disease front matters.

But I really want to talk, and I know we are today going to talk about the next step beyond that, and that is the excitement of this innovation.

Senator Boozman was in Minnesota. It was a little colder when he came. And we went to a farm and saw the glory of precision agriculture and what that means to a farm family when they can know what they can use to have less water, where they can get it, what they need to put pesticides, and do it in a really smart way that is better for them financially, better for our environment, and better for our country.

So I am really excited about precision Ag. Senator Hoeven and I have worked together on a number of bills, including one to make it easier to get loans overall for farmers. And then I have another specific bill with Senator Fischer, and Senator Hoeven is in my bill, is in both the Democratic-Republican versions of the Farm Bill that we really want to actually get done this year, right, to my colleagues. And Senator Smith actually heads up the Commodity Subcommittee of Ag.

So there is just some real work that is being done right now when it comes to loans, and specifically loans for precision agriculture. Precision Ag can greatly save farmers time and money, and I think that we need to make that a major point of our research.

But it has to even go beyond that to the seeds that can feed the world. We have seen the droughts in many parts of our world. I was in India last year and met with the Farmers Union. There

they call them FUs; it is a true story. I brought it up to Modi. I saw an FU, and he got very excited, to the horror of my colleagues.

But the point is that there was American technology being used to make it easier to plant seeds in the middle of some really difficult territory. Sugar beet producers in the Red River Valley have different soil types, growing seasons, and weather patterns than those farmers will face in rice growing in Eastern Arkansas.

And as we work to develop sound agriculture policy, we have to make sure that one size doesn't fit all, and that we understand how this research is going to work in other parts of the country.

But I am just honored to be here with my friend Senator Hoeven, and my two great colleagues, and look forward to hearing from them, and being part of the discussion. Thank you.

Senator HOEVEN. Thank you, Senator Klobuchar.

And now we will turn to our ranking member on the Ag Committee. As I say, somebody who has been up here before, not only to see what is going on with Grand Farm but NDSU. Somebody who has actually not only worked in the public sector on behalf of farmers and ranchers, but he actually used to raise cattle in Arkansas. So he has actually an optometrist by trade, but also a cattle rancher.

And so he brings such great practical experience but also just brings incredible relationships, not only incredible relationships on our side of the aisle but across the aisle.

And as we all know, to get a Farm Bill done; that is what it takes. It is about putting people together on both sides of the aisle, from all different parts of the country. And agriculture is a big, diverse industry in our country, and we have to have a Farm Bill that works for all of our farmers and ranchers across the entire country, across all 50 states. So again, thank you for being here and for being part of this panel.

Senator Boozman, from Arkansas.

STATEMENT OF SENATOR JOHN BOOZMAN

Senator BOOZMAN. Thank you, John. I am an eye doctor, so if you are having trouble with your glasses, or contacts, or want to talk about glaucoma, or any of those things, I will be glad to give you some free advice later on.

I want to thank John for inviting me. It is good to be here. I think this is the third year in a row that I have been here. This is becoming an annual tradition. It is great to discuss innovation in agriculture, the opportunities that exist for the industry through research advancement, and technologies like precision agriculture.

Thank you to Grand Farm for hosting today's important discussion. You all are doing the hard work of developing solutions to some of agriculture's most challenging problems and ensuring these exciting new technologies are actually making it to the farm, which is so important. We appreciate all the hard work that you do.

While we are here to focus on research and innovation in agriculture, I am also so pleased to join with Senators Klobuchar and Smith, along with Senator Hoeven. These are three of the most hardworking, thoughtful people on the Ag Committee. They do a tremendous job, and are also good friends. You know, you hear a lot about the rancor in Washington. The nice thing about agri-

culture is it is not about Democrats or Republicans, it is about easy things like commodities, regions of the country, all of those. But it is important that you understand that we are working as a group to try and get things done.

Similar to North Dakota, Minnesota, and Arkansas, agriculture is the economic underpinning of rural communities across the country. And no matter where we are or who we are talking to, we all hear the same things from our producers and rural communities. Trade is vital for agriculture, investments in broadband and modern infrastructure are needed in rural America, and interest rates and input costs are eating into producers' profitability.

So it is not a surprise that our producers everywhere tell us the future feels very uncertain. This Farm Bill must absolutely put producers first. They need more farm in the Farm Bill. Although our efforts to draft a new Farm Bill are taking a little longer than expected, I know the senators serving on the Agriculture Committee have every intention of crafting a new and improved Farm Bill that meets the needs producers face today.

But more important than just getting this done, is getting it done right. Today's topic of research and innovation in agriculture is an area where we are scrutinizing through our Farm Bill process to ensure continued and improved research opportunities exist into the future. We must foster new technologies for the next generation of producers.

Many on the Agriculture Committee favor ag policy in the Farm Bill which would double funding for agriculture research, the investments in the Specialty Crop Research Initiative, the Foundation for Food and Agriculture Research, and the 1890s Scholarship Program, and also provide a generational investment in agriculture research facilities, which is so very important.

But the majority of the research programs authorized by the Farm Bill depend on the Appropriations Committee. So that means we are grateful for the work of Senator Hoeven and our colleagues on the Agriculture Appropriations Subcommittee to identify and support agriculture's most urgent research needs through programs administered by the USDA, our impressive network of land-grant institutions, and various private sector, and nonprofit partners.

We also know investments in broadband infrastructure are critical for enabling producers to access the results of research, including precision agriculture technologies. Our framework reflects this need for greater connectivity. Precision agriculture technologies are helping our producers be better stewards of our environment, and are supported by Farm Bill conservation programs.

Resource concerns ranging from soil health, to water quality and water quantity can be better addressed as these new technologies come online.

In closing, I look forward to hearing from USDA Secretary Xochitl Torres Small. We appreciate all of her hard work. Under Secretary Chavonda Jacobs-Young, which we also very much appreciate. They have big jobs with big responsibilities. And our other witnesses about the barriers to furthering innovation in agriculture, and what policymakers need to be focused on to encourage innovation, make these technologies more affordable and accessible, and ensure a safe and secure management of sensitive data.

I am pleased that Mr. Harrison Pittman, a proud Arkansan, and Director of the National Agricultural Law Center, is joining us today. The center, which is a unit of the University of Arkansas' System of Agriculture, and receives critical funding through USDA Agricultural Research Service, provides accessible, dependable, and objective legal analysis to food, environment, and agricultural stakeholders across the country. We are grateful for his expertise as we confront some of the legal implications of applying new and emerging technologies in agriculture.

Thank you again, John, for holding today's important hearing.

Senator HOEVEN. Thank you, Senator Boozman. Again, thanks for being here and being part of this field hearing.

I also now I want to turn to Senator Smith for her comments. As I say, she has worked on many issues important to our region, and certainly agriculture is right at the top. Appreciate you being here. Actually, Minnesota has a unique position on the committee, on the Ag Committee. I think it is the only state that has two members on—

Senator SMITH. Iowa, sometimes Iowa, yes; right, sometimes.

Senator HOEVEN. Sometimes.

Senator KLOBUCHAR. But we are unique, John. That is true.

Senator SMITH. We are.

Senator HOEVEN. Right; no, Grassley, right, and Joni. But they do have two members, and that obviously gives them an incredible influence, fortunately—

Unidentified Speaker: I am not going to tell Grassley that you favored the—

Senator HOEVEN. I thought he had moved on to judiciary and didn't show up that much.

Senator KLOBUCHAR. He has tended to only get on in the year of a Farm Bill, so let us just say that.

Senator HOEVEN. The good news, the good news is that agriculture in Minnesota and North Dakota, have a lot of similarities, and so as they are working on things that are important for farmers and ranchers, they are working on a lot of things that are important for our ranchers in North Dakota as well. So we are good with Minnesota having a lot of influence on the committee as well.

But Senator Smith, thanks so much for being here and for your commitment to all things agriculture.

STATEMENT OF SENATOR TINA SMITH

Senator SMITH. Well, thank you so much, Vice Chair Hoeven. I feel like I should call you Chair since you are chairing this meeting.

And my good friend and colleague, I was telling folks last night that every Thursday, usually every Thursday afternoon when the senators get ready to head home, I call it the school bus, and there, on the Midwestern school bus, you have me, and Amy, and John Hoeven, and Kevin Cramer, and often the senators from South Dakota and others. And so in that sort of ride home, we have a chance to connect on a lot of things, including our many shared interests.

So I greatly appreciate being here along with Senator Boozman, and my friend and colleague, Senator Klobuchar, to be a part of this really interesting field hearing.

And I also want to thank Grand Farms. You all are doing really impressive work here, and it is wonderful to have a chance to see what you are doing.

So as with North Dakota, agriculture, food, and energy are the backbone of Minnesota's economy, contributing \$106 billion to our state's GDP and energizing over 388,000 jobs, and this ag sector is, of course, driven by technology and innovation, so staying on the forefront of research and technology is essential to us staying competitive. It is essential to higher farm income, essential to our national security, and to our food security.

And Minnesota has also long been a leader in agricultural innovation and invention, as Senator Klobuchar noted. The University of Minnesota, which is our flagship land-grant agricultural research institution, has been the source of internationally significant discoveries and accomplishments.

We invented the Honeycrisp apple, cold-hardy wine grapes, and we also created advances in shelf life and food safety, along with breakthroughs in precision agriculture. And this work continues today. At the University of Morris campus, we work on clean ammonia fertilizer, and that work has led to a pilot project to produce local clean fertilizer with the potential to give farmers an alternative to costly imported fertilizer.

The USDA Cooperative Extension is helping farmers and ranchers in Minnesota put USDA research into action. For example, the University of Minnesota's Climate Adaptation Partnership is giving farmers new tools for climate forecasting and land management choices, like cover crops and seed selection, and that is boosting their resilience and hopefully their bottom lines.

The USDA has two Minnesota research facilities in St. Paul and in Morris. In St. Paul, the Cereal Disease Lab is researching diseases found in wheat, and barley, and oats, crops that are important, of course, to both Minnesota and North Dakota. And thanks to this research, grain farmers can continue to feed the world.

In Morris, ARS researchers have developed a double cropping system, so farmers can grow winter oilseeds as cover crops, followed by soybeans the next summer, and this innovation can help to improve soil health and also boost bottom lines. These are just a few of the examples of the incredible innovation and research that are happening in agriculture, and we need them.

Farmers are incredibly resistant, and they also face a whole host of challenges, whether it is fluctuating commodity prices, industry consolidation and concentration, high input costs, labor shortages, and severe and unpredictable weather. And these challenges make research even more important.

Thankfully, support for agriculture research is bipartisan, and it is also true that our investments in Ag research have fallen behind the rest of the world. According to the group, Supporters for Agriculture Research, funding for Ag research has declined by nearly a third since reaching a peak in 2002. The U.S. invests just 2 percent of its total research dollars into agriculture research, a percentage that is far outpaced by our global competitors, and agriculture research makes up actually less than 1 percent of the total Farm Bill authorization.

So we have more work to do, which is why I think this field today, John, is so important to the work that we have ahead of us. Senator Hoeven, I am so grateful for your leadership and the bipartisan work that you have done with Chair Heinrich on the Appropriations Subcommittee, including advancing a bill that increases funding for USDA research programs. That is incredibly important.

And on the Senate Ag Committee, where we all serve, agriculture research is also a bipartisan issue. Minnesota farmers tell me that it is urgently important that we complete a bipartisan Farm Bill this year, and as we work towards that goal, we can't forget Ag research. And I know that as frameworks, including the one that Chair Stabenow has put forward as a basis for finding common ground, includes many bipartisan provisions, including for agriculture research.

So I want to thank you, Senator Hoeven, for holding this field hearing. Our two states share a lot in common, including our bedrock support for farming and agriculture. And I look forward to working with you, and Senator Boozman, and Senator Klobuchar, and all of our colleagues in passing a strong bipartisan Farm Bill to boost our support for Ag research and technology.

PANEL II

Senator HOEVEN. Thank you, Senator Smith. Again, thanks to all three of our senators for joining us and for their great work on agriculture.

And we are now going to turn to our two witnesses from USDA. And as I said, we are extremely pleased to have both of them here.

And I am going to start with Deputy Secretary Xochitl Torres Small. And you need to tell me how close I was on that one, Xoch.

Ms. TORRES SMALL. That was exceptional. That was really, really good.

Senator HOEVEN. Thank you. Well, I am glad.

Ms. TORRES SMALL. But also, Xoch, is perfect.

Senator HOEVEN. That is why everybody likes you. Yeah. Thanks for being up here. Thanks for being up here when you were the leader of Rural Development, working with new, innovative, and creative programs then, and for your accessibility. And of course, it is always—in your role, just always important for making all the trains run on time and everything in USDA, but particularly important now as we work on a Farm Bill as well. And your commitment to, as we talk about the future of agriculture, to new and innovative things, which I know you are very open to.

So again, thanks for being here. And we welcome your testimony.

SUMMARY STATEMENT OF HON. XOCHITL TORRES SMALL

Ms. TORRES SMALL. Thank you so much, Senator Hoeven, and thank you for the first panel. Thank you so much, Senator Klobuchar, Senator Boozman, Senator Smith. It is a joy and an honor to get to work with you. It is also really exciting to see this appropriations hearing with the authorizing input and recognizing how crucial it is to have that collaboration.

Earlier this spring, I got to participate in the Land-Grant Institution College Tour, where I went across the country and visited with students who are the next generation of agriculture. And in one of those formats, I had—a woman ask me a question. She asked: What distinguishes American Ag research? And for me, what distinguishes American Ag research is the direct connection to application, through extension, through the way that ARS and NIFA across the board, partner with farmers, work to show that what we are researching has a direct application to support farmers, feed the country, and feed the world, we are able to target that work intentionally.

After that conversation, I learned that that woman was visiting from China, which underscores how other countries are looking at what we are doing with research and trying to outpace us. And as Senator Smith recognized, we are certainly facing that challenge when it comes to funding for agriculture research.

When we look at 2002 being the time when we reached our peak, and in 2019, being in a place where we are at the same funding levels as we were in the 1970s. We know that other countries are attempting to outpace us to take on this work that we have done in the past.

So what are the opportunities when it comes to agriculture research? Well, first it is about the work, when you look at precision

agriculture and unique relationships and partnerships, such as this relationship, this cooperative agreement with Grand Farms. When you look at the opportunities in precision agriculture that then are multiplied by opportunities in artificial intelligence and data, we know there are real chances to expand farm income and invest in farmers.

But it is also about investing in the facilities. And you will hear from Under Secretary Jacobs-Young about the 90-plus facilities that ARS operates. The impact that you have when you come to a college and you are trying to figure out what to major in, and you are looking at the medical facility, and you are looking at the ag research facility, and that might influence what you think is going to be the most prosperous opportunities for you and your family.

And then it is about investing in people. It is about that relationship, those collaborations that we saw here today, that when we are connected to farmers, when we are connected to private sector, and nonprofit sector, we are able to best expand our research opportunities.

I think one way to show that was a recent conversation I had with a generational farm. It talked about the advancements of each successive generation. And the first, the grandfather was the one who purchased the land and got the first tractor. The father invested in water tiling and water technologies for managing control. The son called himself a soil scientist, recognizing that investments in precision agriculture, being able to save on the cost of inputs like fertilizer through directed application, make a world of difference and allow him to continue his farm into the future.

But it will also allow us to continue to advance United States agriculture across the world. One of the last conversations I had at a land-grant institution was a researcher, who said it had always been his dream to work at USDA. And the reason why is because he was an immigrant from India. And he grew up receiving USDA commodities as support for nutrition. And so getting the chance to now come here and contribute to the research that continues to feed the world, gave him purpose every single day.

So those are the many reasons why agriculture and investments in research are fundamental to who we are as a nation, and fundamental to the opportunity of people, all the people sitting in this room, to make sure that we can continue farming into the future for generations, for whatever new innovations to come. Thank you.

Senator HOEVEN. Thank you, Secretary. And I look forward to some questions and answers with you, so I appreciate that opening statement.

And now Dr. Chavonda Jacobs-Young, again, it is so appropriate that you are here, Assistant Secretary, and particularly appreciate your strong leadership on all things research funding for both ARS and NIFA. So please, we welcome your testimony.

Dr. JACOBS-YOUNG. Thank you so much.

Senator HOEVEN. Oh. And I do need to highlight that this is not your first visit as well.

Dr. JACOBS-YOUNG. Right.

Senator HOEVEN. And so you need to keep coming back as we continue to improve the weather every time you come.

Dr. JACOBS-YOUNG. Exactly, exactly. Thank you so much.

STATEMENT OF HON. CHAVONDA JACOBS-YOUNG, UNDER SECRETARY FOR RESEARCH, EDUCATION, AND ECONOMICS

Dr. JACOBS-YOUNG. I certainly appreciate that, Senator Hoeven. And to our esteemed senators, thank you so much for making time to be here today with us. I enjoyed our conversations last night. To my colleague, Deputy Secretary Xoch, she is amazing, and I am just honored to be sitting beside her this morning.

I have had 22 years at USDA, and all of that time working in the science arena, and really working to advance our ability to be able to meet the challenges that we face, not only as a nation, but as a global community, as we do all of this because we want to make sure that there is no one left hungry in this world.

Currently, there are over 800 million people around the world without enough to eat. And a lot of those people are right here in the United States of America. After all, why are we doing what we do? And so as we gather together to talk about Ag innovation and research, you all have made some very strong statements today.

I would like to just talk about three things that I think are important to innovate, to make sure that we can meet the challenges before us. And the first one is be prepared. You have heard about the status of our buildings and facilities. We were at University of Florida when the young lady said: I take tours, and then I have to show the kids our building. And that is not okay.

When we look across our land-grant system, we have tremendous deferred maintenance. In ARS alone, you have heard about some of the amazing work they do. We have over a billion dollars in deferred maintenance. I am thankful for the support that Congress has given us to invest in our facilities, and we just hope to have that continued success.

To innovate, to integrate artificial intelligence, machine learning, GIS systems, we have to have broadband. We have to have high-powered networking systems to move that data to and fro, to analyze, to share, to high-performance compute in the cloud storage. So we need all of those things.

And we need professionals. Currently in ARS, NIFA, ERS, and NASS, we have 1,500 employees eligible to retire today. The 2022 Census told us that our producers are average age 58.1 years old. At point-1, I don't know what that means, but point-1. As I get older, that doesn't sound so old. But we know that a large portion of those producers are over the age of 65. We have a tremendous need to train the next generation of Ag professionals, in a multitude of disciplines and diversities that look like America.

I am thankful for the \$262.5 million in the NextGen Program that was supported by the American Rescue Plan, and further cemented in further legislation, we thank you for that. That is going to help us. So we need to be prepared. Making those investments are going to be important. We can't wait for tomorrow to get prepared for tomorrow.

And the second one is push the envelope. We talked about the amazing work that is already been done by some of our scientists, working together. We can't rest on our laurels. We have to continue to push, push, push, looking 10, 20, 50 years down the road, making sure that we are prepared.

And then the third one, is pass the baton. As many of us have just continued watching the Olympics, I know some of you know how the relay races turned out. And we know that properly securing the baton is critically important to our success.

Well, that is also true in science. If all of the great work that happens here at Grand Farm stays on Grand Farm, we have failed. And passing the baton means that in agriculture, we don't do science for science's sake. There is a problem, we find a scientific solution, and more importantly, we get it into the hands of the people that need it.

And so today, my three points: Be prepared, push the envelope, and pass the baton. And I believe that we have the capacity to do all of that.

So thank you for allowing me to be here today.

Senator HOEVEN. That was very appropriate.

Dr. JACOBS-YOUNG. I dropped the mic.

Senator HOEVEN. I thought that was very perfect, because as I recall, the women just blew everyone away.

Dr. JACOBS-YOUNG. Passed the baton well.

Senator HOEVEN. Perfect baton passes, and really fast running. And it was awesome. And then the men; what is up? Right? Like how many; what, fourth Olympics in a row?

Dr. JACOBS-YOUNG. As a former track athlete, it upsets me, very much so.

Senator HOEVEN. I know. You get the four fastest runners, and they finish, I don't know. Anyway, you are right on passing the baton, a great analogy. And I am glad you are here today to help do that.

Actually, Senator Klobuchar has to step out in a couple minutes, but she will be back. And so she is going to go first with some questions. And that was the agreement we worked out, that she could go first, but she has to come back. So when she goes out there, keep an eye on her. And if she makes a break for it, we will send somebody after her.

Go ahead, Senator.

Senator KLOBUCHAR. All right. Thank you so much, Senator Hoeven. And I know you did call two women Ag leaders here, because they know how to pass the baton.

Okay. So I want to start with something we talked about last night, Dr. Jacobs-Young. And I really appreciate your insights on this. It is just, we are seeing investment in research and infrastructure from countries like China, specifically around the world, and if we want to stay ahead, not just for our own, which we have all talked about, domestic production, and helping feed the world, we are going to have to step it up on innovation, because that is how we have always been able to be the leader. Could you talk a little bit about what is going on around the world with some of these other countries and investment?

Ms. TORRES SMALL. I will say a brief amount and then I am going to pass it over to Under Secretary Jacobs-Young.

Senator KLOBUCHAR. Oh, oh. Thank you. Oh, Deputy Secretary. Nice baton, yeah. Mm-hmm.

Ms. Torres Small: But absolutely, Under Secretary Jacobs-Young can speak to the specifics and the value of the investment. But

when we think about the next opportunities, specifically in artificial intelligence, we know we have real competition when it comes to China. And what we have seen when it comes to Chinese investments in AI, is that they have enormous access to data. And more data, and they are mining more data than we are able to compete with right now.

And so that is why investments in, and specifically NIFA investments and ARS investments in datasets are fundamental to be able to drive that. Because as the United States Government, we have an enormous opportunity because we own so much of those datasets, but being able to put them in a usable way where data can be analyzed, and then used and, then applied for a farmer's benefit is going to be crucial, to be able to continue to innovate the future.

And with that, I will pass it over to Under Secretary Jacobs-Young.

Dr. JACOBS-YOUNG. Yeah. Absolutely, I agree. With high tech comes a lot of data, reams, and reams, and reams of data. And back to high performance computing, cloud storage, how do we put all of those things in place so that we can be competitive? And as we work internationally with our partners, a lot of times we need our international partnerships to solve problems.

We also have to be very cognizant about the need to protect our intellectual property, to establish, you know, basic understandings about how we operate together, because some of these challenges are just too big for us to try to solve alone.

Senator KLOBUCHAR. Good. And my point is, as we, senators up here at this table, make the case for Ag research, we just can't see it in isolation in our own country. It is part of our own national security. It is part of our global competitiveness. You did, as you talk about AI, and the need to move there quickly, you did, Deputy Secretary, talk about broadband, as did the Under Secretary. The latest technologies, as we all know, require good broadband, often fiber, often being able to have the right satellite, and the like. Could you talk about how important it is that we pass the Bipartisan Infrastructure Law, as well as why we need this significant investment in broadband in rural America?

Ms. TORRES SMALL. I was at a roundtable in Virginia when the first farmer of several came up to me and said: Thank you with the work that you did in ReConnect, to make sure that you are measuring connection directly to farms. Because when it comes to rural places, having that connectivity right on the farm is fundamental to futures like precision agriculture.

It also is crucial in terms of collecting data, the satellite imagery, and other components that allow for more precise applications in the future. So thank you for the investment in the Bipartisan Infrastructure Law, and specifically the \$2 billion that went to USDA Rural Development. Rural Development was the first to deliver infrastructure, funding for specifically infrastructure as opposed to mapping, and delivered it directly to communities. And now, with the recurring appropriations, we are able to continue and build upon that work.

The other thing that was really fundamental to that investment was that it included funding for TA. So now, as the rest of the

enormous \$60 billion investment in infrastructure is delivered to states, USDA Rural Development is on the ground, helping provide technical assistance to communities so that they are not left out of this enormous investment.

Senator KLOBUCHAR. Right. Okay, thanks. University of Minnesota is on the cutting edge of developing new crops and hybrids that are hardy in harsh winters—I wonder why we care about that—are resilient to the changing climate that result in efficient and productive yield. The work is supported through USDA NIFA and the many Ag industry companies we have based in our state. How is the Department planning to continue supporting the kind of R&D to get these innovations into the hands of growers?

Ms. TORRES SMALL. When you talk about innovations into the hands of growers, I think about the opportunity in biotech, and specifically when we look at what new seeds and management of seeds might be able to generate, continue to generate higher yields. I have been able to visit some of the really exciting work that has happened, both here and also at North Carolina State University, specifically focused on increased yields with climate resilience, recognizing that drought as well as disaster can also impact that.

If there is anything additional, I will pass it over to Under Secretary Jacobs-Young.

Dr. JACOBS-YOUNG. Just back to the infrastructure point, you know, the U.S. has one of the largest germplasm collections in the world. And that germplasm collection allows us to continuously be on the hunt for traits, the markers we need to continuously improve plants and animals to be responsive to high temperatures, low temperatures, floods, droughts, so in essence to be resilient.

And that germplasm collection is often not seen, and it is something that is a gem for this country, because we have the largest collection, and we can go back and find the genetics that we need to breed into whatever plant or animal that we are dealing with to make sure that we can be responsive.

Senator KLOBUCHAR. Okay. Thank you. One last question; we have done a lot of work on biofuels. We have leaders from our corn growers here, you will hear from shortly, leaders from our soybean growers here, big up here. And as I work with farmers and ranchers across Minnesota, I am often reminded of the importance of our foreign trading partners, but also the need to expand our domestic markets when it comes to bioproducts.

Senator Ernst, and Ricketts, and Stabenow, and I lead the bill to strengthen the BioPreferred Program. Could you talk about, Deputy Secretary Torres Small, could you talk about what research initiatives have the Ag Research Service and the National Institute of Food and Agriculture undertaken to expand the use of Ag commodities in nonfood markets?

Ms. TORRES SMALL. Thank you so much for your focus on the BioPreferred Program, recognizing that as we invest in biofuels and sustainable aviation fuel, we also need to use byproducts to create things like bio-based plastic, or bio-based car seats, and recognizing that by diversifying that market, we are able to build the economies of scale necessary to continue that production.

When it comes to the work and research that we are doing, NIFA is doubling down in multiple ways. Under Secretary Jacobs-Young

mentioned the germoplasma, which is also a resource which is also being used to identify and specifically research feed stocks and the ability to make them more usable for non-food-based applications.

Senator HOEVEN. Thanks, Senator Klobuchar.

And I have got a couple of questions for our witnesses, and then we will move on to our other senators as well.

So starting with Secretary Torres Small, but really for both of you, I would mention at the outset that we put together a formal cooperative agreement between North Dakota State University, Grand Farm, and the Ag Research Service, USDA. We are very excited about it, and we have not only put that cooperative agreement together, through Ag Approps, we are putting money behind it, and we have now since 2022, and we are going to continue to.

Already have done it again in the Ag Approps Bill, which we have moved through the Full Committee this year, and hopefully—last year we were one of the first bills to the floor, I hope we are this year too, and broad-based, bipartisan consensus.

But now I want to ask you about it, because we see this kind of collaborative partnership as one of the ways to put some jet fuel behind reaching into the future when we talk about ag technology, when we talk about precision agriculture, when we talk about ag research, right, because you are bringing all these different sources of innovation, of funding, and of expertise together, right.

And so I want you to tell me if you support that concept. I certainly hope the answer is yes. And then to expound on that a little bit.

Ms. TORRES SMALL. This would be a dangerous place if I said no, but fortunately it is a wholehearted yes. When it comes to public-private partnerships, it is crucial that we work together. And one of the exciting things about Grand Farm and the Cooperative Agreement is that it is not just USDA and Grand Farm, it is also the connection to North Dakota State University, and being able to leverage all of the resources of the land-grant institution.

We have seen that bear fruit in other similar relationships. When I visited Florida, we got to see some of the exciting work that was happening with blueberry genetics because of a public-private partnership that was similar. And one of the things that was unique about that, or that was special about that was being able to have USDA researchers on site with researchers from the University. And that provides an opportunity for some of our expertise, also some of our perspective in terms of working with various different types of farmers, small, mid-size, and large, and what was most going to be needed in terms of research to direct that.

So we are eager to continue to expand this cooperative agreement to look at possibilities like locating ARS employees, and also recognize the importance of making sure that the right technology and lab equipment is here to be able to fully leverage that expertise.

But I am glad that you also mentioned Dr. Chavonda Jacobs-Young, because she was chief scientist when the cooperative agreement was first signed. So I will pass it over to you if you have any additional thoughts.

Dr. JACOBS-YOUNG. Simply to say that the cooperative agreement, when that vehicle is used, means that we are entering into

a partnership. So it is not a grant, so it is not some sort of award. It means that we are walking hand-in-hand with the other party to the agreement.

And so this idea about public-private partnerships, both with private industry and philanthropy, is something that, you know, your wisdom in Congress is infinite wisdom created a foundation for food and ag research, because you will also recognize how important it is that we all work together.

We have talked about the decline in investments in Ag research. We can't afford not to work together. We have to leverage every dollar and every ounce of potential.

Senator HOEVEN. And I want to pick up right there. And again, thank you for being on board and helping us put that agreement together. And you are 100 percent right. The agreement is an official partnership to work together. The funding we bring, whether I work on that through ag appropriations, or whether these great legislators that are here work to bring state dollars into it or whether these outstanding leaders of industry in the ag world that are here today, bring private resources, that is the leverage that makes this a new paradigm that when I say jet fuel, I mean it.

And this is about how in a resource-constrained environment we do a lot more for the people we serve in agriculture. And so when Doug Goering, Secretary Goering goes into—Commissioner Goering goes in to see these legislators, we just give him a stronger hand to get those matched dollars.

Or when a visionary like Greg Tehven goes to his friends at all these Ag companies, large and small, and says, hey, you need to invest in this project, right; it is that leverage, it is that coming together that creates a synergy that takes us to the next level. And that is a very important concept that we want to highlight. And not only is that important for us here in the Red River Valley, that is a national issue. And we want to make sure people understand it and we are going to put all the muscle behind it that we can.

And so any ideas that you have on how we can do a better job, we want to hear them now, and on a continuous basis. So again, as we go into this Farm Bill, are there other things that you would recommend that we do to continue to build that paradigm? And again, starting with Secretary Torres Small and then Dr. Jacobs-Young.

Ms. TORRES SMALL. We have been in close collaboration about the Farm Bill and recognizing that although currently the majority of funding for NIFA comes through appropriations, there has been conversations across all proposals, whether it is the House version, the Senate version, from Senator Stabenow, or from Ranking Member Boozman, all of them recognize the need when it comes to investments and research.

One of the challenges when it comes to the Farm Bill is figuring out how to fund it and knowing that we have got to be honest about the numbers that are available, and basing that on an appropriate assessment. So as we look to invest, both in facilities, in partnerships, making sure that we have a long-term plan that is based in an honest assessment of what money we have available.

And I will turn it over to Under Secretary Jacobs-Young for additional comments.

Dr. JACOBS-YOUNG. Yes. So in addition, and I know we are talking about the Farm Bill, but I want to talk about overall. And having spent 2 years at the White House Office of Science and Technology Policy, and been in Ag 22 years at USDA, we continue to have the challenge of impressing upon people how high-tech agriculture is, that we are a high-tech, scientifically driven industry. So when we talk about whether it is in the Ag Committee or any committee, we should be a part of the conversation, and that we should not have to depend on our cousins to partner with us, that we should be seen as high-tech, scientifically driven, and important for investments.

Senator HOEVEN. Did Greg Tehven, write some talking points for you?

Dr. JACOBS-YOUNG. Oh, no.

Senator HOEVEN. Because I don't know how you could have said that any better.

Dr. JACOBS-YOUNG. No, he didn't, but I like it.

Senator HOEVEN. That was awesome, and that was 100 percent right on, and that is absolutely the idea. So thanks to you both.

Also, Dr. Jacobs-Young, and I do want to commend you both there in OBAN. You are an on-the-ground person here with Rural Development—or I should say Torres Small—excuse me—your on-the-person-ground (sic) here with Rural Development, following your footsteps, I might add, but is doing a great job.

And also Marcy Svenningsen, our State Director, you are doing good work, and we appreciate them very much. So I wanted to acknowledge that as well. Thank you.

Senator BOOZMAN, do you feel up to asking a few questions?

Senator BOOZMAN. I think so. I think I have got enough energy to do that.

Again, thank you all for being here, and we really do appreciate working with both of you. I have gotten to know you both very well, and we appreciate all of your hard work, and it is a lot of work.

Under Secretary Young, before your confirmation and after, we have talked a little bit about the USDA's Agricultural Research Service partnership with the National Agricultural Law Center, and we have a witness here, Harrison Pittman, who actually runs that, and he is going to talk a little bit later. Because we have got all of this advancing technology, and there is legal implications, you know, regarding that. But can you speak to the importance of USDA's partnership with centers like the National Ag Law Center, and others located in states including Arkansas, Minnesota, and North Dakota?

Ms. TORRES SMALL. Senator Boozman, if you don't mind I will start, and then pass it over.

Senator BOOZMAN. Yes ma'am, whatever you say.

Ms. TORRES SMALL. I am sorry. I can't help but speak about the great relationship that we have with Harrison Pittman, and specifically when it comes to how usable the National Law Center's information is. The direct relationship with Cooperative Extension, and providing that national—that legal advice to Cooperative Extension is crucial because it is information in the hands of farmers.

Also, we were just talking about how increasingly important that kind of information is going to be as we look at recent Supreme

Court decisions that are going to impact how we are able to promulgate regulation, and working with the National Law Center is going to be fundamental to identifying how to respond and make sure that our decisions are appropriate, and defensible in courts of law.

It also strikes me in conversations with young people recently that a large portion of farmers are thinking about going into ag law because they see it as fundamental to doing the work on the ground, and so having a resource like the National Law Center is crucial to be able to train not just the lawyers of the future, but the farmers of the future who have that background.

I will pass it over to Under Secretary Jacobs-Young.

Dr. JACOBS-YOUNG. Yes, and as we talk about pushing the envelope, often we have to make sure that we have an innovation ecosystem that is prepared for, you know, often people ask me: So what is the next big thing? And I will say my response is, I know what the next big thing is. It is not big enough.

And so often our systems have to catch up with the next big thing, and so the Ag Law Center is important, as well as a lot of our different processes to make sure that when we have these developments and these discoveries, we can actually use them.

Senator BOOZMAN. Good, thank you very much.

Deputy Secretary Small, you mentioned making it easier to access USDA programs by providing simpler forms, loan applications. I agree that it shouldn't take a grant writer to apply for USDA programs. So can you describe what USDA has done so far and what is planned for the future to make USDA more accessible to rural America?

We have talked about this a lot. In fact, she was actually down in that, we had a, it wasn't a hearing, but we had a listening session in Arkansas, and a mayor from a little town, expressed her concerns of this. You know, this was a very small community, they felt like they needed to hire a grant writer that was going to cost \$30,000, or something, so the Under Secretary jumped in and really helped with that and got the USDA loan.

But I was at the groundbreaking a couple months ago where, it was the biggest area in Arkansas that was underserved with water. So it is 500 families that had no water, that you know, had wells that had gone bad that were hauling water, and because of USDA, and then others, all working together, we were able to solve that problem.

But again, I think what I hear, and I know what you hear too, is it is too complicated, it takes too long to decide, and it takes too long to get the money. I know you have been working on it. Tell us, tell us what is happening and how we can help, as a committee, to make things a little bit easier in that regard?

Ms. TORRES SMALL. Thank you, Senator Boozman, for your strong focus on this. It is a joy to get to work with you on it. And I will tell the story of farm loans as one example of the different ways we have to work to be a better partner to farmers, and everyone who relies on USDA.

When it comes to farm loans, one of the things we recently announced was the ability to apply for your loan online. Now, that doesn't sound like much, but it has been—it has not occurred be-

fore, this administration, and the ability to not have to drive into an FSA office, but you can if you want to, is huge. But it wasn't just about applying for the loan online, it was also about having a tool online that a farmer could navigate to identify what is the right loan product that I should be looking for based on my needs.

And then it was about being able to, we just recently announced another advancement, to be able to pay your loan online, because believe it or not, you couldn't pay your farm loan online before this year.

Senator BOOZMAN. I would believe it.

Ms. TORRES SMALL. Those are the challenges that we face, and so now we have also cut down the farm loan application from 29 pages to 13, and just last two weeks ago, we announced a change in regulation. The farm loan regulations hadn't been updated for 40 years, or longer than I have been alive, and when it comes to making sure that farmers have that access.

Being able to decrease the amount of collateral that is required, limiting whether or not you have to put your home, your private home on the line, in order to get a loan, or extending the term payment so that it fits with your plan and your business plan; this should be able to better serve farmers so that they have the financial freedom to make the investments that they need.

Senator BOOZMAN. Very good. Dr. Young, can you talk about the outreach the Agency does to producer groups, private companies, public research institutions, to understand what they are looking to see the Federal government focus research investments on for innovation, precision agriculture?

Dr. JACOBS-YOUNG. Absolutely. We spend an enormous amount of time in conversation with stakeholders. I was just talking to my colleague sitting behind me here, I just met this morning, about March Madness.

And it is not basketball. No worries, Senator Hoeven, I know I use a lot of sports analogies.

But March Madness for us is right after the President typically releases his budget in February. We have all of the stakeholder groups come to Washington, D.C., and I know they stop by and visit you guys, but they also come to USDA, and we get a chance to hear from them about their top priorities.

More importantly, we get a chance to be able to hear where our programs are working well, and where there are opportunities for us to maybe refocus, and sometimes redirect funding in terms of how we are prioritizing our investments. We spend a lot of time in communication and deal with the 95-plus locations for ARS. A third of our labs on university campuses, we are constantly in the community engaging with folks.

Senator BOOZMAN. Very good. Thank you, Senator Hoeven.

Senator HOEVEN. Thank you, Senator Boozman.

Senator Smith.

Senator SMITH. Thank you, Senator Hoeven. Super interesting panel, I am grateful for this. And I also suspect, Senator Hoeven that I know we are all eager to hear from the industry panelists as well, so I am going to confine myself to one question so we have a chance to hear from everybody.

What I would like to ask you both about, last night we had a really interesting discussion about the value of value-add research, and what we can do so that Midwestern commodities, for example, we don't just ship them off to the Pacific Coast, but we are adding value here, keeping more money and more opportunity here at home.

So I wonder if we—I mean, I think the example that Senator Klobuchar was getting at around advanced biofuels just as one example of what we can do here. So I am wondering if you could both talk about the importance of research in this area, talk about how the public-private partnership mechanism needs to work in this area, and what opportunities you see for farmers.

I am particularly interested in where the opportunities might be for emerging farmers, or smaller scale operations in this area of value add?

Ms. TORRES SMALL. When it comes to value add, it is crucial that we are investing in opportunities for all types of farmers. And specifically, when you look at Ag income, and how it is defined, and how it is distributed, where we have over 85 percent of the funds, of the Ag income, are going to 7 percent of the farmers.

We know that it is crucial that we invest in all, and that added value can be accessible to all. So when you look at sustainable aviation fuel, for example, that is a system that is already set up to be able to—that any farmer that is growing corn or soy should be able to have access to, but we have got to make sure that there is the scale for that. And that is why the upcoming Regulation 45C is going to be fundamental to giving farmers credit for the practices they are implementing on the ground to support access to that market through sustainable aviation fuel.

Another way that we know added value is important is investing in bio-refineries close to home here in the Midwest. Now, Rural Development has a program, 9003, that does recognize and invest in that crucial middle point between when you have got an idea, when you have got the technology, but you have to commercialize it.

Unfortunately, we have had some barriers in 9003, and we have really appreciated the collaboration with the Ag Committee on ways that we might be able to make those funds more accessible, and make sure that that money is being utilized in the most intentional way.

Then it is also about, as we talked about, bio-based products, how do we not just invest in the biofuels piece, but recognize that all of the additional components that might be used through bio-based products and building a real marketplace around that through labeling with rural development.

So with that, I will pass it over to Under Secretary Jacobs-Young.

Dr. JACOBS-YOUNG. Everything that Deputy Secretary Torres Small said. And I will just add that from a research perspective, it is part of our job to stay on the cutting edge, looking at feedstock development, looking at agronomic practices, harvesting, conversion practices, and processes.

And so we want to be in the laboratories, and on the farms really trying to discover what is the next big transformational step in this space, whether we are doing bioplastics or biofuels. So how do we

have that one-two punch, an economic opportunity for our producers in those communities, and protect our Earth?

Senator HOEVEN. Thank you, Senator Smith.

Thank you, again, both to Secretary Torres Small, as well as Dr. Jacobs-Young for being here for your testimony, most of all for your hard work, and the good relationships that we have that are so important as we work forward on this Farm Bill, and all the other things that are important to agriculture in the future.

So that will wrap up this round of witnesses. Although it will not wrap up the work that both Secretary Small and Young are doing here, because there will be a Young Farmer Roundtable that will start at 1:00 o'clock, that I look very much forward to and obviously anyone that would like to listen in on that is certainly invited to attend as well. We appreciate so much your focus on young farmers, beginning farmers as well, and obviously that is going to be a very important component in the Farm Bill.

I think the average age for farmers right now, Dr. Boozman, is about 60, which is remarkably young for guys like you and me.

Senator HOEVEN. But certainly for a lot of folks they think that that is getting up there, where we better get this next generation into the business of farming, and there are some pretty tall barriers to entry, and so that is a very important focus.

So again, thanks so much to both of you. And maybe we could have a round of applause for these outstanding witnesses.

Dr. JACOBS-YOUNG. Thank you.

[Applause.]

Senator HOEVEN. Okay. We will take a quick, and I mean quick, it is five minutes to get the next crew up there, so we will reconvene in five minutes. Okay.

PANEL III

Senator HOEVEN. We continue now with our third panel. We are very pleased to have outstanding leaders from really diverse aspects of agriculture, and very much look forward to their testimony. And it is very appropriate that we are starting with Greg Tehven, who is actually our host here at the Innovation Shop at Grand Farm. And I will say, Greg, this is a little nicer than the farm shops I am used to, although I have got to admit, I have been in some really awesome farm shops. But it does have the flies that I always seem to be in the shop, so that kind of gives it kind of a homey feel for us.

But again, thanks for your great vision, and your leadership, and for being here today. Please start with some opening comments for all of you, and then we will have some questions.

STATEMENT OF MR. GREG TEHVEN, CO-FOUNDER AND BOARD CHAIR, GRAND FARM

Mr. TEHVEN. Well, thank you, Senator Hoeven, great to be with you. Senator Klobuchar, Senator Boozman, and Senator Smith, on behalf of the Grand Farm Board of Directors and our staff, we welcome you.

This is the first ever official event here at the Grand Farm Innovation Shop, so give yourselves a round of applause.

Mr. TEHVEN. We are an organization of 70 partners, many of which are here. And I also want to just provide a special celebration to the technology demos that were here at 9:00 a.m., unlike you, said Senator. But I know Senator Boozman, Senator Klobuchar, and others, enjoyed the technology demos at 9:00 a.m.

Senator HOEVEN. We don't want to have to cut off your mic.

Mr. TEHVEN. Okay. All right, all right. My name is Greg Tehven. I am a co-founder of Grand Farm. I serve as the Board Chair. I grew up on a family farm near here. I had the opportunity to be a University of Minnesota Golden Gopher. I got involved in research. Yes, there is three of us here at least, Representative Pyle, Representative Nathe, if it is safe here to admit that.

But I am really grateful for my experience as a young person and being part of this important effort. Barry Batcheller was a technologist that put the first computer chip on a Steiger Tractor. He went on to build Phoenix International, which John Deere acquired, and then went on to build a company that EGCO acquired. And he asked an important question. What is this region's major? What can we do to make a difference that is transformative? And that was back in 2017.

We got together and looked at the problems advanced technology and agriculture could solve. How could farms be more efficient? How could they be safe? How could we save time? And how could we make sure policymakers were involved in meaningful efforts that allowed those folks to innovate, to do research that could be applied, and provide a healthy economy?

In response to that, Senator Hoeven invited the Secretary of Agriculture out to a piece of dirt that had a porta potty and a tent. And we shared our vision of Grand Farm. This was back in the spring of 2019. And we looked at a robust ecosystem and how these

different groups of established organizations, startups, research organizations could work with producers to solve real problems.

Later that fall, Microsoft made a \$1.5 million contribution to seed this effort to get us off the ground. In 2021, the State of North Dakota's legislature, many of which are here. Let us give them a round of applause.

Mr. TEHVEN. Applied \$10 million of American Rescue Plan Act funding to build a permanent location for the Grand Farm. It was matched by private sector donations through organizations such as Tharaldson Ethanol, Ag Country, and many more that are on the board outside.

The state continues to invest in our state through programs like the LIFT Program to support technology innovation, through our in-state investment program, and countless others. This effort seeded us to provide regional and meaningful collaboration with the Federal government.

We are grateful for the United States Department of Agriculture Research Services Group. This winter, we were able to give our Grand Farm Partner of the Year Award to ARS. And Dr. Jacobs-Young, as long as Dr. Simon Liu, joined us for that.

Our work extends beyond just North Dakota, but allows us to work in Nebraska, at the University of Purdue, and with our friends in Georgia. We even have the opportunity to have the leadership of ARS influencing our thinking. From Dr. Liu's work on the White House's Artificial Intelligence Committee, to the work of Dr. Kappes, a recently retired ARS teammate that has joined our Board, to one of our farm program managers out here on the Farm who is an ARS alumni; she, and the rest of the team learned the problems weeds provide, as you gave us one week to prepare for today.

We are grateful for the Federal partnerships. We are one of nine organizations, the National Science Foundation has partnered with the Engine 2, the only one focused on agriculture. The Farm's team, led by Dr. Hollie, and Cathy, that are sitting in the front row. It is a critical project.

But Senator Hoeven, when I came to visit you with a migraine, you provided me an opportunity to walk up the five flights of stairs to meet with Senator Boozman. And you looked at him and said: Wouldn't it be something if we had an agriculture project?

And you, Senator Boozman, said: It would, but remember our Tribal Nations and what we can learn from the past. And look around at your leaders in your community and ask them to help. We have done that.

I also want to celebrate the work of the Economic Development Administration's technology hubs. We are partnered with the great folks in Montana, with your colleague, Senator Tester that created an opportunity for a rural project. Tim VanVranken, who leads that effort, is here today, as Senator Tester, alumni staff member.

We are part of the Economic Development Administration's Good Job Challenge, where we upskill talent. Senator Smith, you were there to kick that off over in our wonderful Moorhead community. And we also had the SBA administrator here, Guzman, last month, where we worked with startups and entrepreneurs on how to solve these problems.

When I look at the future of agriculture, I am excited about the potential of autonomy, machine learning, and artificial intelligence. I am curious what it would look like for us to continue our collaboration and host the first Federal lab that would focus in these areas for agriculture.

At our grand opening on June 10th, just 2 months ago, I brought my three children with to the opening, a three-year-old, a five-year-old, and a six-year-old. They were disappointed there was no zip line. They were frustrated that AGCO won't let us go in the equipment. There were no robots to play with, and they don't have the certification to fly drones.

But they sat through a presentation where we heard from North Dakota leaders, from our, to our senators, to our congressmen, to several representatives. And that night when I got to bed, I put my five-year-old son—I was trying to put him to sleep, and he started asking questions, he said, dad, if we are going to farm on space, how big does the rocket have to be to bring the tractors with? Dad, how does the fertilizer work on the moon? Dad, can I be part of agriculture?

We have got FFA students here today. We have got technologists. I am excited about your investment in research, technology, and collaboration because we are standing on the shoulders of giants, and we are improving the human condition because food matters. Thank you.

Senator HOEVEN. Thanks, Greg. And that is why we are really—well, we are very glad you are here for many reasons, but you are right, I am not sure we have had a sufficiently robust discussion about how we are going to get the tractor on the spaceship. But that is a pressing issue, and we are going to delve into it deeply. Always fun to have you here, and thanks for your great vision and leadership.

Dr. Greg Lardy, same thing to you. We are doing new and innovative things because we have people that are willing to build the relationships and network and make it happen, and you epitomize that. So Dr. Lardy, please.

STATEMENT OF DR. GREG LARDY, JOE AND NORMA PELTIER VICE PRESIDENT FOR AGRICULTURE, NORTH DAKOTA STATE UNIVERSITY

Dr. LARDY. Thank you, Senator Hoeven. In my role at North Dakota State University, I have the privilege of serving as the Joe and Norma Vice President for Agriculture, and I want to extend a warm welcome to all of our guests that are here today. Thank you for joining us.

In my role at NDSU, I lead our efforts in teaching, research, and extension in areas related to agriculture. This land-grant mission is critical to the future of our state. Our trifold mission began in 1890 with the creation of North Dakota Agricultural College. And it carries on today with 700 dedicated employees across the State of North Dakota, research centers located at seven different locations, and a local county presence in each of the state's 53 counties through NDSU Extension.

In partnership with USDA NIFA, the State of North Dakota, and our county partners, we carry out that extension mission proudly. It should be no surprise that agriculture and food production is

changing rapidly. A growing global population, much of which is emerging from poverty, is demanding additional and higher quality foods. North Dakota, in this region, is uniquely positioned to play a vital role in providing those foodstuffs.

Our state produces over 40 different agricultural commodities, and we lead the nation in a dozen of those. Our producers literally do feed the world, and NDSU is proud to play a key role in that effort through education, research, and extension.

One of the ways we do this is our partnerships with USDA. I just want to give you a couple of examples of those partnerships with USDA's Agricultural Research Service. We have scientists that are working collaboratively with USDA-ARS on a long-term mission to develop tools to ensure North Dakota's public crops are sustainable in the face of many different abiotic and biotic challenges and stressors. They use highly sophisticated models and tools to select plant varieties that are adapted to this region. They also enhance the resiliency of our food supply through those efforts.

Federal investments in that public research allow our farmers and the Nation to remain competitive and have varieties that perform well under harsh growing conditions.

NDSU is also a leader in precision agriculture. We collaborate with USDA-ARS, private industry, Grand Farm, and other organizations to accelerate the development of those critical technologies. This relationship is enhanced with a testbed that is provided by Grand Farm. Thanks to Senator Hoeven for his efforts to strengthen this relationship even more by investing in technology that allows rapid data transfer and utilization of data collection across broad geographic areas. Our scientists can now rapidly solve the various problems that are vexing our farmers and ranchers.

Our partnerships with USDA, private community partners, and others are founded on solid investments by state and Federal resources. These regional collaborations have brought a unique ecosystem to this region and that is at the forefront of agriculture in a fact that was recognized by this region being only one of ten National Science Foundation Regional Innovation grants. The grant provides \$15 million to establish North Dakota as a critical economic hub for Ag technology.

This initiative is poised to drive workforce development, economic growth in the Ag tech sector with the potential to expand to a ten-year \$160 million investment in our region of service. That does not happen with the investments that are being made at the state level.

NDSU is also emerging as a leader in Federal farm policy. The creation of our new Policy Research Center, NDSU will be at the forefront of the development of Federal farm policy related to crop insurance, livestock risk protection, and other critical Farm Bill features that are essential to an adequate safety net for our ag producers. I would be remiss if I didn't mention the need for continued investment in research facilities and infrastructure. You heard this morning from Dr. Torres Small and Dr. Jacobs-Young on data security and data investments, but also our Federal research laboratories and laboratories at land-grant universities need replacement or refurbishing to effectively function for modern research capabilities.

Without reinvestment in critical facilities, the United States will likely lose its competitive advantage as a leader in agriculture and food science research. NDSU is proud of our land-grant mission and the ability to serve the State of North Dakota. We stand ready to do even more with the investments in innovative teaching, research, and extension programs driven by the needs of our stakeholders.

Thank you, Senator Hoeven, for your support. And I would be happy to answer any questions your other committee members have, following the conclusion of the other testimony.

Senator HOEVEN. Thank you, Dr. Lardy, and again, thanks for being here.

Mr. Pittman, thank you for being here as well. As somebody who is a strong advocate of facial hair, I do want to commend you on very strong performance in that category.

Mr. PITTMAN. And I even trimmed it.

Senator HOEVEN. But perhaps even more importantly, for being an expert on legal issues as it relates to agriculture. And we are pleased that Senator Boozman recommended that you join us. And so, again, thank you for being here.

STATEMENT OF MR. HARRISON PITTMAN, DIRECTOR, NATIONAL AGRICULTURAL LAW CENTER

Mr. PITTMAN. Appreciate you having me. So thank you for hosting this, and to Senator Smith, Senator Boozman, and Senator Klobuchar, it is an honor to be here with you, and I do commend you for taking on this very challenging and important area of Ag research and innovation and technology.

I will very briefly give you just a quick background on the National Agricultural Law Center and highlight some key issues, and then, of course, I am more than happy to answer questions.

I would also like to say it is really impressive to see such a great turnout, and I think that is very important and it shows the commitment people here have, and to see so many friendly and familiar faces. You can tell by my accent I don't get up this way very often, but I get to see a lot of you guys and gals around the country, and it is good to see you here.

So I serve as the Director of the National Agricultural Law Center. The Center was created by Congress in 1987, so just think back to a time period where the country was in the throes of the farm crisis of the 1980s, and you had a variety of interests from producers, to lenders, to government employees, to elected officials at the Federal and state level, and the list goes on, who were suddenly confronted with what to do when the music stops, and there really was not a place to turn to as an objective, nonpartisan resource.

And so the idea was pitched to create the Ag Law Center, and the function that we were originally created for continues today, but the issues have grown, and they have expanded in so many different ways.

Our mission is to serve as the Nation's leading source for agricultural and food law research and information. We work basically for everybody in the ag community, producers of all commodities in all states around the country, state ag departments, farm bureaus,

county committees, you name it, trade associations, commodity groups, and the list goes on and on, and the work. For example, here in North Dakota on issues like foreign ownership of agricultural land, we have interacted quite a lot with stakeholders here in helping think through and draft legislation where they drafted. We were a resource to them in terms of what states do.

We are federally funded. We do have one of these partnerships that we have talked about today with Agricultural Research Service. We enter into cooperative agreements with the ARS, specifically what is called the National Agricultural Library, which is a part of ARS. A lot of the issues we cover, Federal crop insurance, all things, environmental law, Farm Bill, and I would add to that Farm Bill implementation.

And then I would add into that, based on the panel we had just in the last hour, we do a lot with students, too. We try to do a lot of outreach for students that are interested in careers and issues in agricultural law, and that is pre-college, and undergraduate, and law students.

Turning to some of the key issues in ag technology and ag research, in my view, and this is an area of pesticides, it is an area that has changed the most in my 20-plus years, almost a quarter century of being involved in agricultural law, and if ever there were good old days in pesticide registration, I think they have ended. And I don't think that it will get easier any time soon. I think the changes are likely long term, and just given the connection between the technology of pesticides and productivity.

But then the further connection with conservation, and we think about things like carbon sequestration that enable conservation practices like no-till or minimum till, the more difficult it is to have predictability with respect to the registration and the use and availability of pesticide products, it will have an impact on those areas.

I would highlight that it is also an area that ties into your general picture of innovation in Ag biotechnology, because we are now in an era that the spray, the pesticide, is attached to the seed technology, and that is an Ag biotech issue that is an important one to think through. Checkoff programs or Federal research and promotion programs, I think those are important to keep in mind.

Those do not involve appropriations, but they do involve funding that comes through the Federal research programs, and right now there is roughly two dozen that are overseen by the USDA Agricultural Marketing Service, and those programs provide a lot of funding, producer-funded, a lot of that is in the research realm.

They do face legal challenges from time to time. There are some actions in the court system now. But I think one area that I have encountered, and over the past several years, are questions about: What types of expenditures are allowed from one checkoff program to the other with respect to, what I would call, physical infrastructure; particularly at the land-grant systems, whether that be certain equipment or even bricks and mortar. And I think that is an area that is deserving of further exploration.

The last things I will mention, foreign ownership. That is been a red-hot issue. It continues at the Federal level, and certainly at the state level, and that ties in a lot on your Ag innovation. There

is a lot of foreign investment in agriculture, and it has presented unique challenges as state legislators have worked through these, and, of course, there are issues at the Federal level, and I would be more than happy to answer questions on that.

And the very final, I would throw out something that I don't think has come up yet today, but the theft of data. And that is something we have seen in different states, including Arkansas, that, frankly, it is as simple as picking up the technology, the seed from a field, putting it in a pocket, and going back to whatever country that is.

And we have had that happen in Arkansas, and effectively putting the technology of a company in a pocket in reverse engineering, and it is gone. And I think that is another area that warrants attention.

I will stop there. I am less than a minute over, and that is pretty good for me. And I am going to stop right there. I thank you very much.

Senator HOEVEN. Thank you. We will move on to Josh Gackle. Josh, again, having you on this panel is so appropriate. You are out there farming every single day, and so getting the job done, knowing what those challenges are that your fellow farmers face. Also as the president of the American Soybean Association, representing them in that capacity, you know, that is exactly the kind of input we need to have on that, not just today but every day, to get things done the right way.

So thanks for being here. Go ahead with your testimony.

STATEMENT OF MR. JOSH GACKLE, PRESIDENT, AMERICAN SOYBEAN ASSOCIATION

Mr. GACKLE. Sure. Thank you, Senator Hoeven, and Senator Boozman, Senator Smith, Senator Klobuchar, for being here today and for this important meeting. And thank you for allowing me to testify today.

As Senator Hoeven said, my name is Josh Gackle. I am a North Dakota soybean farmer as well as a corn farmer, barley and wheat as well. But I work with my dad and brother on a third-generation farm in Kulm, North Dakota, about two hours southwest of here.

And this year I also have the privilege of serving as President of the American Soybean Association, which represents U.S. soybean farmers across 30 states. The states that you represent, North Dakota, Minnesota and Arkansas, planted about 20 percent of the U.S. soybean acreage in 2023. For farmers to plant, market and transport over 80 million acres of soybeans each year, we rely on Ag research and technology to help move us forward.

Funding and public policy supporting Ag research and technology are impactful and their benefits are far-reaching to soybean farmers and throughout the entire value chain. Research helps increase productivity and environmental and economic sustainability. Thanks to investments in seed technologies that make production possible in colder and drier climates, like here, and like where I farm, two hours southwest of here, soybean acreage in North Dakota has increased tenfold over the past 30 years.

Precision Ag technologies improve efficiencies of critical inputs, including land, water, fertilizer, and pesticides, but their adoption

is limited by farmer affordability, and especially during this difficult farm economy. So ASA supports legislation in the new Farm Bill to make precision Ag technologies and research tools more accessible.

On a different note, research also helps improve farmer resilience. It supports farmers' mental health by improving understanding of these very real challenges and helping to identify solutions and connecting farm and ranch families with stress assistance services. In addition, soybean market opportunities also expand thanks to research. Research helps drive market development of over 1,000 new uses for soy.

Some examples, these include protein-rich livestock feed, clean-burning biofuels, and PFAS-free soy-based fire suppressant. That is just to name a few examples.

Market research and investment benefits extend to trade as well, resulting in over \$32 billion in U.S. soybean exports in the 2022–2023 marketing year. Research contributes to the building of efficient infrastructure, which is necessary for moving crops to market and enhancing the competitiveness of U.S. agriculture. Soybean farmer funding has contributed to research enabling port capacity expansion in Washington State and the dredging of the lower Mississippi River, just to name a couple examples.

Funding for research and technology does not come from a single source. We rely upon multiple funding streams, public, private, and checkoff resources, as Harrison mentioned. Each of these funding streams is critical to our success and should not be viewed as substitutes for one another.

So we appreciate this subcommittee's work to provide Federal resources for various needs, and we encourage funding in a timely manner. We also appreciate the Senate Agriculture Committee's efforts to authorize and fund initiatives impacting research, technology and beyond. ASA is grateful for the opportunities provided by the Ag Committee in 2022 and 2023, and for our organizations to testify regarding the many Farm Bill challenges and needs of soybean growers. We need your help again this year in getting a new and improved Farm Bill done in 2024.

Strong funding streams are necessary for USDA, land-grant institutions, and others to deliver research results, this contributes to a more informed soy industry and public, but only if funded sufficiently. It is concerning to us that U.S. Federal Ag Research funding has declined while other countries have maintained or increased their funding levels.

Private-sector resources complement other funding streams. There are significant investments of resources and time to bring innovations and technologies to market, ensuring that a science-based and risk-based approach to regulation is critical for continuing meaningful access to farmer production and crop protection tools.

And finally, here, farmer-funded checkoffs at the national and state levels complement public and private funding. Created over 30 years ago through an Act of Congress, the soy checkoff delivers a high return on investment for farmer-invested dollars, \$12.34 for every dollar invested by farmers.

So ASA urges the protection of the checkoff from harmful amendments that may arise in the appropriations process or through the authorization of a new Farm Bill this year.

So to conclude, if U.S. agriculture is to remain a leader, regulatory regimes, technology adoption, and system programs, and increased ag research funding that welcome and stimulate innovation, are necessary.

Again, I want to thank you for the opportunity to testify. And look forward to any questions and further discussion. Thanks.

Senator HOEVEN. Thanks. Thanks, Josh. Again, thanks for being here.

Also, Mr. Wolle, thanks for being here. As you are a Minnesota farmer, I would ask if Senator Klobuchar might make some opening remarks for your introduction.

Senator KLOBUCHAR. Very good. And I want to thank you for being here, Harold. Harold Wolle, we are not only proud of him as a Minnesotan from Madelia, Minnesota, Madelia strong, but also he is, in fact, the President of the Corn Board—of the National Corn Growers Association, which is a farmer-led association. And he has been a long-time farmer, and has been a leader in our state. And we think it is very cool he is out here on the national stage.

STATEMENT OF MR. HAROLD WOLLE, PRESIDENT, NATIONAL CORN GROWERS ASSOCIATION

Mr. WOLLE. Well, thank you. I am Harold Wolle, President of the National Farm Growers Association, and a corn, and soybean farmer from Madelia, Minnesota. I appreciate being invited here today to speak on behalf of NCGA's 40,000 dues-paying farmers, and 300,000 farmers contributing to corn, research, and promotion through checkoffs in their states.

I want to thank you, Ranking Member Hoeven, for holding this important hearing today in your home state. It is also nice to see my home state Members of Congress, Senators Amy Klobuchar and Tina Smith, here today along with Senator Boozman of Arkansas. You are all doing yeoman's work as members of the Senate Ag Committee to get the Farm Bill through Congress this year.

And Senators Boozman and Hoeven, you are doing double duty, serving on both the Appropriations and Agriculture Committees. All of your efforts are deeply appreciated.

Turning now to the topic at hand, agriculture technology and research, these are important topics and are top of mind at NCGA. There are many issues related to this topic that we are focused on advancing. But today, I want to talk to you about securing appropriations funding for two key projects, the Agriculture Genome-to-Phenome Initiative, and NCGA's Aflatoxin Mitigation Center of Excellence.

The Agriculture Genome-to-Phenome Initiative provides collaborative research opportunities that expand the industry's knowledge of genetic traits across crops and livestock. This type of research is critical to fully characterizing these genetic traits and, in turn, providing producers with the knowledge to make better management decisions, increasing both their productivity, and their sustainability, and profitability.

NCGA and the Iowa Corn Growers Association have a long history of supporting this initiative and have worked with Congress to secure Federal investments into the program, we are grateful that the Senate Appropriations Committee has shown support for this funding in the fiscal year 2025 and we are pleased to see that the House Ag Committee has proposed reauthorization of funding for the Agriculture Genomes-to-Phenomes Initiative, is in its draft of the Farm Bill.

This initiative is well positioned for continued Federal support, and we urge the Senate Committees on Appropriations to continue to elevate this program as negotiations continue.

A second priority in the area of technology and research is securing funding to address aflatoxin contamination, which has been a significant problem for producers in southern states for several years. More recently, it has expanded into the Midwest and Western Plains States. The increased frequency of extreme weather events will further exasperate this problem and continue to expand the impacted geographic area.

Direct losses of corn caused by aflatoxin are estimated at \$200 million annually with indirect losses from byproducts such as distillers grains further adding to the loss. Recognizing the significance of the threat, corn producers have contributed more than \$5 million since 2012 in private funding for research projects through NCGA's Aflatoxin Mitigation Center of Excellence to better understand and attempt to mitigate the risk of aflatoxin to corn growers. While research conducted over the last decade has made meaningful progress in developing and deploying mitigation strategies, there remains a considerable gap between the amount of research currently being performed, particularly regarding responsive agriculture, human nutrition, and food safety, and the magnitude of the issue.

To expand this important research, NCGA and its state partners pursued Federal funding for the program, and successfully recruited \$1.5 million through fiscal 23 and 24 appropriations. These dollars have been thoughtfully invested in select research projects nationwide to advance the development of aflatoxin mitigation.

We are pleased that the House Appropriations Committee, report for its Fiscal 2025 agriculture funding, including an increase of a million dollars for AMCO, and ask you and your fellow senator appropriators to secure that funding as negotiations progress.

Finally, corn growers appreciate the multiple roles of public and land-grant universities including education, research, and extension. At the National Association and State Association levels we often partner with these institutions on agriculture policy research to help understand and evaluate the farm economy, expected budgets, and Federal policy.

In summary, Federal funding for Ag research has plateaued and the industry cannot afford to weaken that investment. By bolstering Ag research across the board we can address the issues I have enumerated while tackling additional challenges related to other areas impacting agriculture like trade and biofuels.

Thank you again for the invitation to attend this field hearing. And I look forward to answering questions.

Senator HOEVEN. Thank you Mr. Wolle. Thanks for being here.

Mr. Debertin there was a big fight over who will introduce you.

Senator SMITH. And I won.

Mr. DEBERTIN. I hope it wasn't a big fight.

Senator HOEVEN. They did go in the back room and settle it.

Mr. DEBERTIN. I hope it wasn't a big fight.

Senator HOEVEN. And Senator Smith is accorded the honor.

Mr. DEBERTIN. Okay.

Senator SMITH. Senator Klobuchar and I rarely have big fights, and never in public, so.

Senator SMITH. Listen, thank you. Senator Hoeven, I am really honored to be able to introduce to the group, Jay Debertin, who is the President and Chief Executive Officer of CHS, which is the nation's leading farmer-owned cooperative and an agronomy global energy grains and processing company.

Jay has been president of CHS and CEO since 2017, but that was following 33 years of leadership roles across the country, so he brings a broad range of experience to these issues, and is a good friend and we value CHS very much in Minnesota. So thank you Jay for being with us.

STATEMENT OF MR. JAY DEBERTIN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, CHS

Mr. DEBERTIN. Thank you Senator. Yes I have been with the company for 40 years, so when the Deputy Secretary said she wasn't even 40 yet it was humbling.

The thing I would like to just start with for the people in the room that maybe don't see these four people in Washington, that you know, they do have a D or an R behind their name, but when you are in their offices you wouldn't know that.

The Ag focus that they have is dead-on, and they are focused at solving Ag solutions whether, they have a D or an R, and I have seen it in action, I have worked with their staff, and that is the way they work.

You know, Senator Klobuchar raised Norman Borlaug's name earlier today, and I hadn't thought about him in some time, and did great work at research at the University of Minnesota, Iowa, went on to Mexico, largely centered around wheat, and then some other things. He won the Nobel Prize. He won the Nobel Peace Prize because of what food means to world peace.

And so if we don't have enough gravitas about the work that we are doing here that should remind us of strong farmers, strong agriculture, and what that means to the world, so kind of a good reminder, a good reminder for me.

So at CHS our purpose is to create connections to empower agriculture, and that means we provide what the farmer needs at every step along the way, meaning the fuels, and renewable fuels, and fertilizers, and seeds, and grain, and grain processing. They harvest it and then when they are ready to sell that grain we find the best market and the processors from around the world.

So Harold and Josh, we thank you for the business that we get from your crop that comes off.

Today, I will address not only the importance of agriculture technology which people have spoken very, very well to, and CHS is a founding member in Grand Farms, and we are very, very proud of

it. I would also maybe like to spend just a moment speaking about some other things within a future of agriculture, too, certainly creating certainty in programs like the Farm Bill, tax codes, free and open trade markets are foundational for American cooperatives, and for farmers and ranchers to thrive, and that that world market has to be kept in mind.

But beginning on the importance of agricultural technology being on the forefront of technology enables our cooperative model owned by farmers and our owners to stay as efficient as possible while competing in a global scale. Our business relies on innovative thinking and in the supply chain to move things faster, better, and safer, by harnessing the power of technology we are positioning the farmer owners for the future.

We are a proud partner in Grand Farm. We are also a proud partner in Ag technology venture called Cooperative Ventures, which is \$50 million that we have—we and a partner have devoted towards capital JV within Ag technology space. So we are all in on Ag technology, it is just so fundamental and foundational to the future of agriculture.

There is also other things that we are focused on in this in this environment. And I just would like to take a moment to speak up about you know the Farm Bill that came up.

And Senator Boozman, we were together in your office just two weeks ago, and your commitment to getting it done this year, if it wasn't clear to me then it is today, of the importance of getting the Farm Bill done this year. The change that we have seen in agricultural conditions just in the last few months that many people in this room know what is happened on commodity prices.

If we thought we had an option to push it into next year, I don't think it is there. I think you were dead on with the importance to get it done this year. And I just want you to know that at CHS, and I am sure for the other people at this table, whatever we need to do to help, because it means cutting some—making some decisions and arriving at an agreement which you, all four, have done before in the field of ag, and others have too. We will be there.

And likely somewhere somebody is going to be unhappy with the decision made, we will support—if all four of you are voting for it, CHS will be right there, because that tells me that you have crossed the aisle and you figured it out. So I just give you that piece of support for a Farm Bill yet this year for CHS.

And then the last thing I would speak to is just to remind everybody the importance of the international trade, this industry relies on international markets, this industry relies on that global customer as one option, clearly a couple of really nice processing assets built, where you can see them over here, and that is good, and we have got a handful of them too, and it is a great option for farmers, and it is a great option for the crops. The global customer also needs to be part of it.

And so trade promotion, trade protection is really, really important to us at CHS, and I think to agriculture, in general. So happy to take any questions you might have on any of those fronts. But thank you for your leadership.

Senator HOEVEN. Thanks to all of you for your comments and now we will take some questions.

I want to start actually with Greg Tehven and Dr. Lardy. For both the Farm Bill as well as the farm Appropriations Bill I want to know what is most helpful in terms of what I talked about here a minute ago, and what you all addressed, and these new partnerships, synergistic partnerships that we are putting together, like the one I have talked about between NDSU, Grand Farm, and ARS USDA; how do we do more and do a better job? Obviously more funding, I got that part. So Greg you don't have to mention that, or Dr. Lardy. I got that.

But the whole point is we are thinking beyond that aren't we? We are thinking about how we bring more resources to the party from all the partners, I mean, how do we do a better job of that Greg and—both of you are Greg, so that is easy, Gregs how do we do a better job of that?

Mr. TEHVEN. Well I want to defer to Dr. Lardy. And I just did want to make one comment. When Grand Farm got off the ground when it was back, we went from one porta potty to three porta potties, so we were expanding. It was both NDSU and CHS that were the collaborators. A land-grant university and a large co-op that said we are going to help. And we have learned a lot from both organizations and so I think it would be most appropriate for Dr. Lardy to start.

Dr. LARDY. Senator Holman thank you for that question. One of our key parts of our strategic plan within NDSU agriculture is more partnerships, and so those partnerships can take a variety of forms, they don't always have to involve financial resources. And so sometimes those partnerships are the technical resources, and that scientific collaboration that happens across agencies, and within collaboration between land grants and private industry.

One of the unique things that the State of North Dakota does is for higher education is challenge grants, and so that is bringing state resources with private resources to fund scholarship endowments, and those sorts of things. So maybe there is an opportunity for the Federal side to look at those sorts of things to leverage those Federal resources against resources that can be brought to bear from private or NGO sources, or others that might be helpful as well.

But really, when we think about partnerships it is not just those financial resources, but it takes a variety of forms.

Senator HOEVEN. But in the funding maybe matched, matched funding.

And maybe that is good for everybody, right. Like, if we are going to get out there and hustle, and raise a lot of resources from the private sector in the State of North Dakota, and other places, maybe other folks should have to get out and hustle a little bit, or maybe they don't get the same level. I mean, right, it is about encouraging folks to leverage, and rewarding those that get it done.

Mr. TEHVEN. Senator, I would I would bring three things to the forefront, one is the role of ecosystems. So as we look at the role of ecosystems and the collaboration around multiple sectors, we are absolutely better together. And so when we look at the Federal funding opportunities there seems to be a stronger focus on ecosystem development of which we agree with.

The second area, I just want to thank you all, is your process. All these Federal grants, from the CHIPS and Science Act, to the work with the Economic Development Administration, those collaborative application process are very well thought through, even the Small Business Accelerator Grant opportunities, those working exercises allow us to collaborate, we learn from each other.

I think about the work that we are doing with Montana through Senator Tester's leadership in the tech hub, the opportunity for us to collaborate with a Paris-based startup- that has a solution for potato-based organizations to collaborate with researchers at Montana State University, to apply that research in a testbed at Grand Farm that improves our productivity with lower input costs, that collaboration matters.

The last thing, and Senator Hoeven, I would argue, you are the best at this, because you provide platforms for entrepreneurs. I remember early in my career as a University of Minnesota student, a professor giving me the opportunity as an undergrad with a white very curly afro to present to the MBA students about our startup in the dorms.

The platforms matter. You brought me to the State of the Union when I didn't even own a tie. I thought it was in Bismarck, and Amy was nice to me there. But when you provide platforms for entrepreneurs to share their work, like you have done with Appareo, as you have done with so many of our startups. Your platform matters.

When we began the exercise to raise the funds for Grand Farm, Senator Hoeven, you hosted the dinner that brought the funders to the table and saw the vision. You all have platforms, and I would advocate and urge you to continue to look for the entrepreneurs, look for the problem solvers, look for the folks that are emerging versus established, because their solutions are sometimes hard to understand but your ability to bring us up matters.

And so I thank you Senator Hoeven for doing that, and I challenge you to look for more entrepreneurs to elevate, and use your convening power.

Senator HOEVEN. Thanks to both of you for those thoughtful comments.

I am going to shift now to Josh Gackle and Harold Wolle. As we do these things you know whether it is the research the technology, all these things, how do we do a better job of making sure it is, you know, farmer-friendly, it is going to work on the farm and getting it to them—getting it to you sooner? So how do we make sure that has utility, and what do we do to, you know, get it to you sooner, better, and so forth?

Mr. WOLLE. Well that is always one of the issues in research: How do you distribute your results in a meaningful fashion? And my answer is what we have talked about already, collaboration. You know, in the corn world it is a lot of state check-off dollars that get collaborated with the Extension Service, and you know, extension does a good job in Minnesota of them distributing their research results, and communicating what they have found to the actual farmers. So that is my answer to how we get the information out to folks, collaboration.

Mr. GACKLE. Yeah. I would certainly agree. I think when it comes to rolling out the programs, and implementing them, and doing it so efficiently and farmer friendly as you mentioned, as with the funding, it is a collaborative effort. We need the public-private commodity organizations, checkoff organizations, you know, government dollars. The coordination there, it is just as important to coordinate the outreach on the backend, once things are funded and programs are developed.

It is really great to have Deputy Secretary here, and USDA represented, it is these types of conversations that can ensure—you know, identify what the challenges are, find some solutions, so that the programs that we use as farmers, what we are using on the ground, is farmer friendly, makes a difference on our farms, contributes to our profitability, all those things that we want to be wise and good stewards of the resources that we are given. So that cooperation on the backend is, I think, what we need to do more of.

Senator HOEVEN. For both Mr. Pittman and Mr. Debertin, just a couple quick thoughts, maybe just one or two thoughts. What can we do on trade, on trade to advance the ball?

Mr. PITTMAN. You said to be brief, so I would say more.

Whatever we are doing is never enough. I think that that—if you were to ask me, like, what I think are the top, say, two or three issues in the ag industry going forward, trade is always going to be a one two or three. And you know it is a very challenging environment to, you know, look at the experience like with TPP, the years that go into that, and you know, it is very difficult to get these bilateral agreements, and they take a long time to get them out into multi-country agreements and get the consensus.

And so, I think it is really difficult, it is a very challenging environment. I wish I could say more than that, but it is just dropping your shoulders, and going for it over and over, and you have to push, and sometimes you don't succeed with it, and you know, an effort at a trade agreement failure on one day could be preparation for success when you come back the next time around.

But it is obvious that it is a key part of long-term economic viability of the Ag industry in the United States, and so whatever we do, regardless of who is in the White House, regardless of who controls Congress, it is always more, in my view.

Mr. DEBERTIN. And Senator my comment would be this is an area that we have no trouble competing with, the U.S. farmer can compete with anyone around the world. We don't have our hand out, we don't need incentives. We would like it if people were supportive, that would be nice. The thing to stay away from is the barriers that go up that inhibit the trade, as those go up by either party it hits agriculture right in the forehead, right in the forehead.

And so if I—my answer to your question is, be positive for it, say nice things about trade, we are not asking for any kind of assistance in that regard, but we are very cognizant of barriers that get put up that get in the way, because the U.S. farmer can compete just fine, just fine. It is when the barriers get put in the way that it gets problematic, by anyone.

Senator HOEVEN. Thank you, all.

Senator Klobuchar.

Senator KLOBUCHAR. Thank you very much Senator Hoeven. And thank you for that impassioned note Mr. Debertin, for trade. And I think, what is it, 95 percent of the world's customers are outside of our borders, and we need fair trade agreements that work for America, but it has been very important to our success in agriculture. We just see the lowering of the tariff on frozen turkey into India, and what a difference that is going to make when there is over a billion people there.

Could you talk about how the co-op system could be used since you are the biggest co-op?

Mr. DEBERTIN. Yes.

Senator KLOBUCHAR. When it comes to innovation and research, and how you can partner with public and private.

Mr. DEBERTIN. So we are, and that is why—that is what brought us in to be a founding member of a Grand Farm, and a venture capital firm, focused on technology. The benefit of the cooperative model is, kind of answers the Senator's question, of how can we bring these quicker to producers. The cooperative model allows us really to do that, because the sooner that we get our hands on it, the sooner we can bring it to roughly 575,000 farmers that we either serve directly or indirectly, and we can do it really fast.

The question is how fast does it scale? Because scale is a big issue, and good ideas are great, but can they scale to the production capabilities that the U.S. farmer has, because it is massive. So good ideas, and how fast can we get them to scale, and then get them out in the trade territory, and the cooperative model is particularly well positioned to do that, and so.

Senator KLOBUCHAR. Good. Well, thanks also on that pitch on the Farm Bill and getting it done now. I am obsessed with this because the last thing we need is uncertainty, and we already have these volatile and lowering prices right now on the commodity side, and getting it done now, we don't know what is going to be going on politically next year. You know I have some views of what I would like to see happen, but we don't know.

And no matter what, we are going to have new leaders in place and that takes time for people to get set, and we don't really have that time right now, and so I want to get this done this year.

So Mr. Wolle, we know what we are talking about here with the commodity prices, the droughts, and what we have seen in the past, but now flood conditions this year that causing some diminished yields. I have seen them myself out there. What innovations are farmers using to improve crop resiliency? What would be helpful here in terms of leveraging public and private resources?

Mr. WOLLE. You know, everything seems to be interconnected to me. I know tomorrow Secretary Vilsack is coming to Minneapolis, St. Paul, for a roundtable on the bioeconomy. So you know, what we can do to improve our carbon sequestration helps us with the durability of our land, and the resiliency of our crops.

So you know, cover crops are going to be a part of that. I would like to say we intensively manage our farm, and the different soils are going to require different practices, and hopefully as we implement those practices, going forward, we are going to be sequestering more carbon, we are going to be producing low carbon corn

for the biofuels for sustainable aviation in the future. So I think, you know, it is all interconnected and we need to work to go forward and solve all of these issues.

Senator KLOBUCHAR. And of course those fuels also include biodiesel. We know that. So thank you very much.

I wanted to—Dr. Lardy I am getting freaked out by that yellow and green tie you have on.

Senator KLOBUCHAR. And then we have got this up here too. I get this Bison theme. It is particularly hard for Senator Smith and myself, because it also looks like the Packers colors.

Senator KLOBUCHAR. That is like a double whammy from both sides. But however, the truth is there is a lot of collaboration going on with our states. Your work facilitating the collaborative research takes place between University of Minnesota and North Dakota State. One area that has really benefited from this collaboration is research on sugar beets. This work is one of the reasons the Red River Valley is the largest sugar beet producing region in the U.S.

Could you speak to the ways that your collaborative research approach is able to stretch the dollars further to provide accurate info to producers?

Dr. LARDY. Senator Klobuchar happy to answer that. And this is the NDSU Tartan tie. So it is produced by our Fashion Apparel's Department. They did a very nice job.

Senator KLOBUCHAR. But it is still the same colors though.

Senator KLOBUCHAR. It works for Packers fans too. Here in the audience today is Joleen Hadrach, and Joleen is a member of the administrative team with the University of Minnesota. And we are very proud of the long-standing collaborative relationship that we have with U of M. In fact, we have about six faculty positions that we jointly share, specifically across state lines.

And as you mentioned, one of those is related to sugar beets. And so for opportunities and collaboration, one of the ways to stretch those dollars is to seek those partnerships where two parties or more are bringing resources to the table to provide those resources. And specifically in sugar beets, it has really resulted in some key opportunities here in the Valley to enhance productivity of our sugar beet farmers, because of an emphasis on things like disease control, plant pathology work, and improving the ability of our sugar beet farmers to respond to some of those challenges.

And as you know, as you think about those industries on both sides of the border, critical to the economy in this region, and we really appreciate the U of M's willingness to collaborate with us on those types of positions.

Senator KLOBUCHAR. Yeah. One other area, quickly, Senator Thune and I lead a bill that would require USDA to identify, collect, link, and analyze data on conservation and production practices, and that can help with producers to reduce risk, increase profitability. How can the USDA, in your mind, better utilize this data to improve the technical assistance to farmers?

Dr. LARDY. Yeah, Senator Klobuchar; great question. And as you look across the scientific literature, there are thousands of studies related to, as Harold mentioned, you know, the need for carbon sequestration and carbon in soils. But they are all very discreet. They are all separated by geography, separated by soil type, et cetera.

So I think an emphasis on a national database, meta-analysis to help analyze that data and provide at least better initial predictions or recommendations on how we might proceed. We are still going to need additional field research to verify some of those sorts of things, especially related to carbon storage. But it is critical that we develop a more robust database and a way to analyze that in a meta-analysis that brings better results.

Senator KLOBUCHAR. And I assume, just a quick one-sentence answer, that AI and the potential there would be very helpful with that?

Dr. LARDY. But Senator Klobuchar, by AI, I am an animal scientist, so I am assuming you mean artificial intelligence and not animal—

Dr. LARDY. But the answer to that is yes.

Senator KLOBUCHAR. Okay. Yes. Thank you for defining it.

Senator HOEVEN. Now, we are going to turn to, I think, the only AI-certified member of the Senate, Senator Boozman.

Senator BOOZMAN. Thank you, Mr. Chairman. And, again, thank you all so much for being here.

Harrison, I was taking notes. You said data protection, pesticides, checkoff, foreign ownership, theft of data, and several others. I would add the orphaned land problems that we have. I think the carbon credit market is going to create some problems with greenwashing, and things like that. All of these are new things.

I am going to be in Texas in a couple weeks, in August, South Texas, with Senator Cornyn. And again, I am going to be down there for the purpose of talking about the water war with Mexico. And that has destroyed the sugar industry in Texas. It doesn't exist anymore. So these are big things.

This, we have got who's who of people in agriculture here that represent all different phases, from our legislatures on down. If people want to contact the National Ag Law Center, how do they do that? What is the easiest way? How does it work?

Mr. PITTMAN. I thought you were going to ask a harder question.

Senator BOOZMAN. Well, this is a really important question.

Mr. PITTMAN. So it is simple. You just email us or call us. You get a real person, and we interact with people, literally, numerous times each day from all over the United States. And so just go to our website, nationalaglawcenter.org, or go to Google, type in anything close to Ag Law Center and you will find us. And just reach out.

I do always—since we are putting this out so publicly, I would always caution people that we are, in general, subject to FOIA. And so, if you just want to send an email that says: Hey, do you have a minute to talk? That is fine. But we interact with people like that all the time, and so when y we are super easy to get in touch with, and phone or email works quite well.

Senator BOOZMAN. So when you call them, tell them I said to be extra special nice to you.

Mr. Gackle, your testimony mentioned the importance of science-based, risk-based approaches to regulation so that farmers can gain access, quick access to innovation, including crop protection products and advancements in biotechnology. In many cases, a confusing regulatory system is an impediment to research in the first

place. Can you speak to the importance of regulatory certainty to avoid disincentivizing innovation?

Mr. GACKLE. Thank you, Senator Boozman. Thank you for that. That is a really important question, an important topic. It is something that American Soybean Association, corn growers, other commodity groups are constantly involved in that discussion with EPA, and other state and Federal regulators.

Certainty for the companies that are producing the product is needed. You know, a particular herbicide to bring to market can take over, you know, a dozen years or longer, and \$200 to \$300 million to bring one particular chemistry, or one particular new herbicide product to market.

So you know, who pays for that? We do. As producers, as growers, as users of the product, right, so any length in time, extended time, difficulty in getting there, bringing those products to market adds to our cost as farmers, particularly in these difficult financial times for us, it causes great uncertainty.

And then kind of on the—also on the producer side, just to talk a little bit about what we are facing as growers, and you know, we spend a lot of time talking with EPA, but encourage you as well, as Congress, to engage with EPA. You know, one specific example right now is EPA is, you know, they are in court a lot, getting sued when they bring a new—if they approve a new label for a particular product. Typically it is related to the Endangered Species Act.

So EPA is now in the process of identifying insecticide and herbicide strategies that they can use to become ESA compliant. And we as growers, and as American Soybean Association, appreciate the difficult spot they are in. You know, we don't want them to get sued either. We need these products. And when they are sued in a particular label, glyphosate, or dicamba, or any particular thing, it takes that tool away from us.

So we want them to get through this, but we also really engage with them and want to make sure that what they are doing is usable on the farm, that we can actually employ those practices and still use the product. We as farmers, we are the best stewards of those products. We don't want to use more than we have to, but we need to control the pests, the insects. We need to be able to do the conservation practices, we want to apply on our farm when it comes to no-till or minimal-till, Harrison identified that earlier, but we need those products to be effective in that way.

Senator BOOZMAN. Very good, thank you.

Mr. Wolle, precision Ag technologies rely on a massive amount of data. Have you seen producers' views about privacy or data ownership concerns change as more producers have been adopting these technologies? And what challenges still exist in this space?

Mr. WOLLE. Well, I think that we will see change, as you have indicated. It is so important to have this data available and used in our systems. You know, we are going to have to verify that we are producing low-carbon corn. We are going to be relying on our equipment manufacturers to automatically collect that data, and turn it into useful information that is verifiable so that we qualify for the different programs that are out there.

So I think producers are starting to realize that. And so, you know, they still want to own their data, they still want privacy for it. But they know that it needs to be collected in order to be useful.

Senator BOOZMAN. Very good. Mr. Tehven, can you describe your observation of how private investments in innovation and precision Ag technologies has increased or decreased compared to Federal investments in the areas? And can you describe how these two funding streams complement one another?

Mr. TEHVEN. Thank you, Senator. You know, in our journey of building Grand Farm, when Microsoft's then President Brad Smith stood on the stage with Governor Doug Burgum and made a \$1.5 million commitment, it sent a signal to folks that both the State of North Dakota as well as a private player were interested in participating.

There are several legislators in this room that challenge the private sector to participate in funding of this facility as well as the 590 acres of land that we have the opportunity to do applied research, education, and demonstration on. My sense from what I have heard from folks like Representative Nathe or Senator Wozniak is they wanted to see the private sector engagement.

What they didn't anticipate was the out-of-state engagement. Organizations like Farm Credit Services of America out of Omaha, CoBank, or AGCO. When AGCO became our anchor tenant and committed to not only putting team here, resources, but bringing 10,000 producers and educators to this facility at maturity, it sent the signal that this collaboration works.

As we think about the ability of private sector organizations like CHS to use their venture fund to identify startup companies like Sabanto, an autonomous tractor solution, investing their resources, and bringing the technology solution to the producer to be more efficient, less labor-intensive, and profitable, that is what gets us excited.

As for the Federal Government, there are some challenges. We have over \$1.4 million of accounts receivable of earned contracts from Federal appointments. Thank goodness we have friends like the Bank of North Dakota that provided a loan for us to make sure that we can pay for our costs. I would encourage all of you to work with the Federal agencies to increase the efficiency of these dollars that have been committed and ensure that we are paid in a timely way.

It was very uncomfortable sitting in this room and telling my Board of Directors that we needed a loan to make payroll. And when you have \$1.4 million of accounts receivable, it is really challenging.

And yet our friends like Maple River Grain wired us the money on the day it happened. Or when we asked North Dakota's Farmers Union and the four additional Farmers Union organizations to support us, they said—when we asked for a \$100,000 commitment, they said, would you take \$300,000? And that money showed up in our account. And so that is where I think part of the challenge of the Federal system is, is to fulfill the Federal commitment to us that are taking risks, that have talented team, and we have to stay up late at night and convince our Board to take out a loan so that we can make payroll.

Senator BOOZMAN. Thank you. Thank you, Mr. Chairman.

Senator HOEVEN. Senator Smith.

Senator SMITH. Thank you, Senator Hoeven. And thanks again to all of our panelists. It is great to be with you. I am going to start with Mr. Wolle. Harold, I think, let us see, I saw you last week at Farm Fest, today, and last night, and then tomorrow at the University of Minnesota. So it is great to be seeing you. Harold and I first bonded when I led an Ag trade mission to Cuba when I was lieutenant governor. So we had a good time on that trip, didn't we?

Harold, I want to ask you the question I asked the first panel, which has to do with the issue of value add. And we were talking last night about how, you know, Midwestern produces. This is true, of corn growers and soy. We want to be able to add value to our products here at home and not ship those products away. We want to be able to have that money and opportunity stay here. So could you just talk a bit about the importance of research in the area of value add, where the public-private partnership opportunity is, and what we should be thinking about?

Mr. WOLLE. You are absolutely correct. Value added is so important to our communities. You know, but whether it be the hog industry in Southern Minnesota, or the ethanol industry, those are so important to provide good jobs. Plus, we are so blessed in this country to be able to produce more than we can consume locally, domestically. So we need to have trade in order to balance our supply with our demand.

So we need research that helps us, whether it is research into the animal diseases that I see as a huge threat to our livestock industry, or whether it is research into the biofuels that are value-added for us. When we can become a more sustainable industry, when our value-added industries can be more sustainable, any research that helps them do that is very necessary and greatly appreciated.

Senator SMITH. Thank you so much.

Josh, would you like to comment on that?

Mr. GACKLE. Yeah. Thank you, Senator Smith. Maybe just a specific example; and it is a little bit beyond the research part, although very important. Harold mentioned biofuels and that industry. What we have done here in North Dakota with renewable diesel, and the expanded crush, just right down the road here, with the new plant here that had a groundbreaking just last week, I believe. And then down the road about 70 miles, another crush plant, around 100 million bushels of soybeans each year available to be crushed in North Dakota and used mostly for renewable diesel.

What we are seeing right now is the rules of the road to bring that renewable diesel to market, and the feedstock that we are using to get there is causing some concern in farm country, and you all are, I am sure, very much aware of it.

But getting the rules right when it comes to the 45Z tax credit, or working with our states to make sure that they are putting—that the rules of the road are—California is a great example, CARB, just the other night came out with their new set of rules that is going to be very, very disadvantageous for U.S. soybean producers, and other agriculture feed stocks that we grow as farmers here.

So I think, you know, the research is critical, and the funding there to bring those products forward and to promote them, but getting the rules right at this stage in the game is equally as important.

Senator SMITH. Thank you. Thank you. So next I want to follow up a little bit on Senator Hoeven's question about what we can learn from the Grand Farm collaboration, what is working here. And I was really struck by, Greg, your description of this as a—and we heard this on the first panel, too, the description of this sort of ecosystem or hub. You know, we think about that a lot when it comes to med tech or IT, but maybe we don't think about it enough. I am sure we don't when it comes to Ag tech.

Everybody in this room is on top of it, but people outside of this room don't really think of agriculture as a highly technology-intensive field. They just don't understand it. So I want to kind of drill in a little bit.

Maybe, Jay, you want to get on this. I want to drill in a little bit on what that hub or ecosystem means for attracting investment? Whether it is venture investment, or early-stage investment to fuel the innovation that is happening at places like Grand Farm?

Mr. DEBERTIN. So Senator Smith, I would say this. The people outside this room that are in the tech space, they know about Ag. They found it, and they are jazzed about it, and they are throwing money at it. Now, some of the ideas probably aren't going to go where they might hope to go, but plenty of them are. And I think Ag farm—or Grand Farm provides that opportunity to test that technology, help get jump-started in some cases for us to bring kind of the beginning technology ideas to this platform to do something with.

The other aspect that I wouldn't lose sight of is the new people joining agriculture, they are jazzed about this kind of work, and they want to be part of it, and some of us can kind of get weighed down by the issues and the problems. They essentially have an attitude of: Give me the ball. Give me the ball. I want to have a part of this, and I want to do something with it.

And it just gives me tremendous optimism that the technology ideas that will come to market are—it is going to work. Now, we have just got to do our part around consistent funding, and having at least a view that the rules that we are operating under will be there for some period of time, rather than two-year windows or four-year windows. It gets difficult to make significant capital investments by people in our shoes when those windows get so short.

Senator SMITH. Yeah. That is helpful.

Mr. Debertin. So I would just offer that up. The longer you can give us some certainty, then I think the more you are going to see that investment follow it. The shorter certainty we have, people will tend to stand back, I think.

Senator SMITH. Yeah. Thank you. Greg, or Dr. Lardy, would you like to comment on this?

Dr. LARDY. Absolutely. So one of the beauties of Grand Farm is that it brings together such a unique set of players, and so our scientists and faculty members that come to Grand Farm get to interact with startup companies, they get to interact with scientists

from USDA, ARS, they get to interact with people that are the long-term players in the ag industry. And you know, when you have that sort of ecosystem that is what results in the National Science Foundation investing \$15 million over the next couple years in that ecosystem, because we are bringing together players in a way that doesn't happen everywhere.

And so I think that is what is really exciting. And Jay mentioned the young people that are involved here. These young people are the future of agriculture, and we have got some of them in the audience today, but we have a lot more that we can reach. A lot of high schools that don't have ag programs, ag science programs, that is another critical function of getting somebody that goes to Fargo Davies or Fargo Shanley, that might not have grown up on a farm or ranch, interested in the, gee whiz, about why I can't I—how can I engineer a solution here? Or how can I get involved in Ag policy? I am interested in law, but what about Ag and food policy?

Senator SMITH. All right, thank you.

Mr. TEHVEN. Senator Smith, I think about our work to understand the pain points and frustrations of farmers. We had a conference for a while that had an Angry Farmer panel. And we would just ask the farmer, hey, you are angry. And then 45 minutes later, it was like a Senator Hoeven opening statement. He just kept going—they just keep going, right? Sorry, too soon?

Senator SMITH. There is a level of directness in North Dakota that I think we could learn from, Amy.

Senator HOEVEN. We still might shut off your mic, right.

Mr. TEHVEN. But when we look at those pain points, then the ecosystem can solve them. And sometimes it is unlikely folks. You saw Boson Motors in the back. These folks read a pain point report and they needed on-farm mobility autonomously. So there we have it. Or we think about how does the farmer get the crop from the field to the elevator? And all of a sudden this summer, CHS announced their autonomous trucking solution here on our opening day, because they are working with North Dakota's Department of Transportation.

Or just last month, the folks at Heartland Forward out of Bentonville, Arkansas, which is definitely an amazing city that we should have the next field hearing at, and I hope I get invited, as well as to the inauguration that Senator Klobuchar is hosting. But we went to—these folks from Heartland Forward came and they hosted a roundtable with national leaders on artificial intelligence and agriculture. And there is former United States Senators, like Heidi Heitkamp. And there is a 20-year-old student that is investing in artificial intelligence.

These are the collaborations as we think about the Heartland. We need strong workforce. We need strong schools. But we also need imagination and creativity, and the ecosystem provides that.

Senator SMITH. Thank you. Thank you, Senator Hoeven.

Senator HOEVEN. Thank you, Senator Smith. And we will wrap up now. I just want to thank—there is a lot of work that goes into official field hearings. So I want to thank staff members, and then I will ask the senators for their closing comments, and we will wrap up.

And I will start with, from Senator Klobuchar's staff, Thomas Liepold, Ben Lien, and Erica Nelson; from Senator Smith's staff, Adam Schiff, Carson Ouellette, Sara Silvernail, and Miranda Morgan, Lilla; from Senator Boozman's staff, Coleman Garrison, and Kate Covington; from my staff, Daniel Mencher, Seven Sassano, Jessica Lee, Tom Brusegaard, Alex Finken, Maddie Fazen, Aaron Weber, and Dan Auger.

Also, at the outset, I introduced the legislators, I did miss one, Representative Karen Karls, who comes from an Ag background, and is a big friend of agriculture. So I certainly didn't want to leave her out.

With that, I am going to turn to Senator Klobuchar for just any final comments before we wrap up the hearing.

Senator KLOBUCHAR. Well, thank you so much, Senator Hoeven. Two things I have learned is Senator Smith and I were having a coffee drinking game over how many times we could mention Minnesota. You guys might not have noticed it. We did quite well.

And then, Senator Hoeven, one of the hallmarks of a senator that is in touch with their state, or any representative, is when people are willing to give you a hard time sometimes. And I thought Greg really rose to that occasion. As well as a server last night, when we were having dinner, where he is commanding the room, and says, we are so glad to have Senator Boozman here, all these out of town guests. And she has standing there, very strong North Dakota server.

And he then says, and you guys, we can stay as long as we like tonight. You can stay as long as you like. She goes, no, you are not. We are ending at 9.30.

[Laughter.]

Senator KLOBUCHAR. So we have had a great time here. I especially want to thank Senator Boozman for coming all the way from Arkansas and being part of this. And I look so forward to working with him. I think as many things you come away with here, the challenges that we are having with corn and soybeans—looking at Marv over there—right now, and the challenges that all our farmers are having, that we can't keep our eye off that long-term ball, which is the research. Because the answer to some of these challenges for the world around us, for feeding the world, for keeping our leadership and security in the world, is making sure we are investing in this research and that we are not outdone.

And it is actually the answer for the short-term problems, but it is certainly the answer for a lot of our long-term innovation. So I am really excited about the work that is going on here, Greg, as well as the work going on in Minnesota. And we are just ready to lead. And to that, we need to get the Farm Bill done as soon as possible.

The way I look at it, let us get this done now. And there will be other opportunities as well for us, especially on this research side, to make the case in other bills and the like, to continue to expand on that, because we have such a strong argument to make for the research now that is in the Farm Bill, for our great appropriators that are going to get this done. But then we can keep expanding that, because I believe we have an argument way outside of agriculture in the immediate to do that.

So thank you for planning this, John.

Senator HOEVEN. Thank you, Senator Klobuchar.

Senator Boozman.

Senator BOOZMAN. Thank you, John, for getting us together. And it is great to be here. It was great to be in Minnesota when I was visiting with Amy and Tina and being in that part of the country.

You know, the one thing I have learned traveling the state in the situation that I am in, if not traveling the state, traveling the country, is farmers are the same every place. And they are the same, and yet a one-size-fits-all from Washington is certainly not the answer.

So I think these types of things are so important to get us together, to get you all together. We learn so much from our witnesses, but you learn so much just visiting with each other between the sessions and things.

So again, thank you all for being here. This has been really meaningful to me. I believe with all of my heart that the answers need to come from the ground up. I am committed to getting a Farm Bill done as soon as possible. I don't think it is going to get any easier next year, regardless of the administration. Farm Bills are tough. On the other hand, we don't need to just do something. We need to do the right thing. So that is going to take all of us working together. But again, we can get there. There are no ifs, ands, or buts. Thank you.

Senator HOEVEN. Thank you. Senator Smith.

Senator SMITH. Well, let me just add my thanks to John and Amy, and especially to all of our panelists for your insight and feedback. And I love doing these field hearings, Senator Hoeven, because I think we all understand that the best ideas are going to come from folks that are closest to the work. The best insights are going to come from people who really know what is happening on the ground, and can advise us and guide us as we think about the decisions that we are making about policy, and also about spending.

And so to be able to hear from all of you has been really a treat. I am so glad that our colleagues from USDA were able to be here, too, to provide their feedback and insight, and also hear from all of these great folks from this part of the country about what is happening, and where the gaps are in research, and what we need to do differently and better.

So just huge thanks to everybody. And look forward to continuing this conversation as we move forward.

Senator HOEVEN. Thank you, Senator Smith. Thanks to all of the senators for being here. We truly appreciate it so much.

Also to Secretary Torres Small, and Secretary Jacobs-Young, thank you for being here. We deeply appreciate it. As well as to all of our witnesses, and all of you that have come to this hearing today. Again, we appreciate you being here today, and we appreciate your advocacy for agriculture.

With that, a transcript of today's hearing will be available on the Senate Appropriations Committee website in the coming days. Again, thank you.

And we are adjourned. Thank you.

SUBCOMMITTEE RECESS

[Whereupon, at 12:56 p.m., the hearing was adjourned.]

