REGENERATIVE AGRICULTURE: HOW FARMERS AND RANCHERS ARE ESSENTIAL TO SOLVING CLIMATE CHANGE AND INCREASING FOOD PRODUCTION

HEARING

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REGENERATIVE AGRICULTURE: HOW FARMERS AND RANCHERS ARE ESSENTIAL TO SOLVING CLIMATE CHANGE AND INCREASING FOOD PRODUCTION

Tuesday, July 19, 2022

HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON ENVIRONMENT
COMMITTEE ON OVERSIGHT AND REFORM
Washington, D.C.

The subcommittee met, pursuant to notice, at 2:06 p.m., in room 2154, Rayburn House Office Building, Hon. Ro Khanna (chairman of the subcommittee) presiding.

Present: Representatives Khanna, Cooper, Ocasio-Cortez, Tlaib, Gomez, Krishnamoorthi, Norman, Gibbs, Fallon, Herrell, and Comer.

Also present: Representative Flood.

Mr. KHANNA. The committee will come to order.

Without objection, the chair is authorized to declare a recess of the committee at any time.

I now recognize myself for an opening statement.

Climate change poses serious threats to food security. As the magnitude and frequency of extreme weather events increases, disruption threatens our food supply at home and abroad. Elevated temperatures contribute to causing drought, which depletes water reserves, worsens crop yields, and increases fire risks.

The United Nations estimates that global food production must increase by at least 60 percent to meet the expected rise in the Earth's population by 2050. Global yields of maize and wheat, by far the world's two most consumed crops, will decline significantly due to global warming in the coming decades.

The resulting higher food prices and food insecurity will disproportionately harm low-income communities and communities of color.

Farmers are a key part of the solution. Regenerative agriculture is a system for food production that puts more back into the ground than it extracts. With regenerative practices, farms provide benefits to their environment. Regenerative farms improve water and air quality, soil health, and ecosystem restoration, all the while increasing productivity. It's driven not by Washington, DC. It's driven by the farmers themselves and their ingenuity. Regenerative practices can lower carbon emissions and provide clean water, clean air, and rebuild farm communities.

It's rooted in millennia of tradition. Our modern industrialized food system makes it difficult to practice. The market power exercised by agribusiness or family farmers leave little flexibility for regenerative practices.

The top four beef-packing companies control nearly 85 percent of the market. The top four pork packers control 71 percent. Just four companies control 90 percent of the entire global grain trade. Companies use that market power to dictate how farmers must produce livestock, grain, fruits, and vegetables. Farmers are often prevented from diversifying crops, integrating livestock with crops, or adopting other regenerative practices.

The industrialization of agriculture has had a tough impact, a negative impact often on rural economies. Consolidation and industrialization have caused nearly 17,000 cattle ranchers to go out of business every year since 1980. Today family farmers earn just 16 cents on every dollar spent on food at the grocery store. Financial stress has contributed, unfortunately, to a suicide rate among farmers that is six times the national average.

We should support farmers and invest in rural America. Farmers providing environmental services through regenerative agriculture must be compensated for those services. Pay farmers for regenerative agricultures. For example, the Environmental Quality Incentives Program and Conservation Stewardship Program are two of USDA's primary working lands conservation programs. They're underfunded. Listen, just last year, the USDA granted 27 percent of Environmental Quality Incentives Program's eligible applicants and just 35 percent for the Conservation Stewardship Program.

Federal policy supports inherently unsustainable practices. By law, the Environmental Quality Incentives Program must spend 50 percent of its funds to benefit livestock producers. Those same companies will control the vast majority of the market share. Commodity subsidies and subsidized crop insurance primarily go to crops used for livestock feed. The government-subsidized loan costs primarily benefits the largest producers, who often don't use regenerative practices.

Today I'm introducing legislation to support regenerative agriculture. We must fully fund the USDA's conservation programs. We must reform them to provide farmers more flexibility to do what they think is best, as opposed to being dictated by corporate executives, who may have no actual experience in farming. We must enable farmers to be environmental entrepreneurs on their land. Basically, we must listen to farmers themselves. No one knows what's best for the land better than those who work on it day in and day out. They know better than those of us in D.C. They know better than the corporate executives. And the resolution says: Listen to farmers and pay farmers for the practices that they think are best for their soil.

In addition to our witnesses here today, I want to thank Matt Russell of Iowa for his many years of leadership on this issue. Matt Russell really has pioneered listening to farmers. Finally, I want to thank Secretary Vilsack for his relentless leadership for farmers and rural America and his investment in many programs on regenerative agriculture.

I now recognize Ranking Member Norman—we may sometimes disagree, but he is always collegial, and I really respect his service—for an opening statement.

Ranking Member Norman.

Mr. NORMAN. Thank you, Chairman Khanna.

I'll return the compliment to you. You have always been open, and we may not agree on many issues, but you're congenial, and I really appreciate that.

I would ask for unanimous consent for Representative Flood to waive on for today's hearing.

Mr. KHANNA. Yes. I see no objection. He is on the committee.

Mr. NORMAN. Great.

Agribusiness in South Carolina is South Carolina's No. 1 industry. From corn and cotton to tobacco and turkey, the farming industry in South Carolina accounts for a quarter of a million jobs and almost $50 billion in direct annual economic impact. Farmers and ranchers are the real stewards of the land, not left-wing bureaucrats in Washington, DC.

Since President Biden took office, the agriculture industry has fallen under severe attack. Input costs for farmers are surging. From May 2021 to May 2022, these costs increased 15 percent. The cost of fertilizer alone is 77 percent higher today than it was the same time last year.

I had a farmer three months ago, which is planting season, tell me: Where can I get fertilizer?

He could not get fertilizer to fertilize his crops, which produce the yield, and as all of you know—and I did research your background. All of you are farmers and have experienced it firsthand, but he couldn't get fertilizer. That's a direct result of a lot of different reasons, but fuel leads the way as one of the main culprits.

Farmers and American people are facing record-high prices for gasoline and diesel, and I can assure you tractors, combines do not—you cannot plug in. They do not run on solar panels. Increased input costs are cutting deeply into the farmers' bottom line. Some are not sure if they can even break even.

I was telling Chairman Khanna, my cousin is a pretty good size chicken farmer. Guess what he called me about that he could not get? Feed for his pullets. He could not get feed for the pullets to feed the chickens, and I was telling Ro that they supply a lot of the fast-food markets. It's coming pretty quick when we will not get be able to get the chicken biscuit or they will be severely limited or they will be priced so high people won't have it because the trucks cannot afford to get on the roads to deliver the feed for his pullets. Eighty-year-old company, first time he's ever had this problem.

The Biden administration's proposed revisions to the Waters of the United States, otherwise known as WOTUS, rule, will re-ignite Obama-era uncertainties, uncertainties that President Trump had resolved to benefit America's farmers. The revisions would broaden the definition of what a navigable Federal waterway. This will lead to nationwide revaluation of Federal stream and wetland permits, saddling farmers with additional hoops to jump through.

Just last month, President Biden's EPA proposed a new rule that would severely limit the use of Atrazine, one of the most popularly

used herbicides used by farmers, and I'm anxious to get into the debate on the elimination of pesticides and how that works. Atrazine, which is safe for humans, it allows farmers to produce a large yield of crops while keeping prices affordable. President Biden has again put the interests of far-left environmental groups over farmers, ranchers, and the American consumer.

The Biden administration has not targeted farmers with regulations—it has not just targeted farmers with regulations, but also with the new tax proposals as well. His proposed legislation, the American Families Plan, would cost farmers millions of dollars. And God help us if a farmer dies because transferring wealth and transferring that farm could be saddled with an exorbitant tax bill. When the head of a household dies under President Biden's reckless taxation and spending plan, they could be forced to sell their farm, which they will have to do.

Ironically, President Biden recently called U.S. farmers the backbone of freedom. If that's the case, why do Biden's administrative policies continue to harm the livelihood of farmers, which is what many of you—most of you testifying today do for a living.

Democrats want to tell farmers they need to lower their carbon emissions, but they will allow China to pollute the environment more and more every day; coal plants being built every week. We need to let farmers farm, not shoulder them with burdensome regulations and huge tax bills. As most farmers tell me: Get the bureaucracy, get the government out of the way and just let them do what they were born to do and, in many cases, born with their families to do.

Last, but not least, this came out today. On top of all of the issues we've got: Global supply chain crisis could worsen in 2022, the survey shows. Just getting products to the farmers to help do what you do is going to be even worse than it is today. God help us all.

Chairman Ro Khanna, thank you so much for the witnesses today.

Mr. KHANNA. Thank you.

I now recognize Ranking Member Comer—good not to see him on Squawk Box but here—for an opening statement.

Mr. COMER. Thank you, Chairman Khanna.

And, before I get into my opening statement, I too want to recognize Congressman Flood of Nebraska to the Oversight Committee, and we'll be giving you a formal introduction in a full committee hearing tomorrow.

And I want to thank the witnesses for participating here today.

The U.S. agriculture industry is the best in the world. For generations, American farmers have combined technology, science, ingenuity, and work ethic to outpace global competition. Simply put, American farmers are the best at what they do. I understand firsthand what our farmers do for our Nation and our world.

When I served as the Kentucky commissioner of agriculture prior to coming to Congress, I worked very closely alongside Kentucky farmers. The agriculture industry in Kentucky alone provides over 250,000 jobs and is home to more than 74,000 farms, most of which are small family farms.

However, the Biden administration's radical environmental policies are hurting our farmers. Hours after taking office, President Biden shut down the Keystone Pipeline, cutting off a huge source of American energy independence. The Biden administration held off renewing or approving oil and gas leases, contributing to historic gas prices. For the first time ever, the national average for gas was over $5 a gallon. California's gas prices, Mr. Chairman, reached nearly $10 a gallon.

Further, our supply chains were already struggling to recover from COVID shutdowns. Now they're trying to recover with skyrocketing energy prices, and that's pretty tough to do. Just look at our grocery stores. They are struggling to keep the shelves stocked. Meanwhile, we have parents across the country having a hard time to feed their babies because of a shortage of baby formula. The Energy Index also rose 41.6 percent over the last year, the largest 12-month increase since 1980.

The Biden administration's energy policies have contributed to all-time high food prices and historic inflation. It would be great to talk to the Biden administration about this, but today, once again, the Democrats talk about Federal policies, and there isn't a single witness from the Biden administration on our panel. Instead, we're going to hear how farmers need to use regenerative farming practices. Well, American farmers are already doing that. Farmers regularly use sustainable practices to create a higher yield and promote efficiency on their lands.

Unfortunately, Democrats love using this catch-all term as an excuse to justify more regulation on farmers. They want to claim that if only farmers were forced to use these techniques, then climate change would be solved. But we should not and cannot wrap up farmers in bureaucratic red tape. Doing so will hurt farms, destroy American food supply, and do nothing to solve climate change.

Sadly, the Biden administration continues to burden farmers with more regulations that create more costs and uncertainty, and these costs are passed on to the American people who are struggling to make ends meet due to a 40-year high inflation.

Take the proposed revisions to the Waters of the United States rule, the WOTUS rule, for example. This rulemaking would cutoff access to crops on farmers' lands because it gives the Federal Government power over any waterways on the land. Now, what sense does that make?

Under President Biden, the EPA is also trying to limit useful herbicides, pesticides, and fertilizers. These products, however, allow farmers to produce high yields and safeguard human health. Again, what sense does that make, especially when our economy is suffocating from inflation?

President Biden tells American farmers they should be feeding the world, yet he removes the tools and the technology they need at every turn. Advances in these technologies keep the U.S. No. 1 in agriculture and keeps food on the table for America and the world.

For the sake of American farmers and consumers, the government should not have a bigger seat at the table. It needs to excuse itself from the table and let American farmers do what they do best, and that is succeed.

Thank you, Mr. Chairman. And I yield back.

Mr. KHANNA. Thank you.

Now I would like to introduce our panel of witnesses.

Our first witness will be Bonnie Haugen, who is owner of Springside Farm in Minnesota.

Our second witness will be Kara Boyd, who is the president of the Association of American Indian Farmers.

Our third witness will be Doug Doughty, a Missouri grain farmer and cattle producer.

Our fourth witness is Dr. Rachel Schattman, assistant professor of sustainable agriculture at the University of Maine.

I recognize Ranking Member Comer to introduce the final witness.

Mr. COMER. Thank you, Chairman Khanna.

The final witness I'm very pleased to have with us today: Mr. Brian Lacefield. He is the director of the Governor's Office of Agriculture Policy in Kentucky, a lifelong friend of mine from a great farm family in Christian County, Kentucky, and, like me, a graduate of Western Kentucky University with a degree in agriculture. So very pleased to have Brian Lacefield as a witness.

I yield back.

Mr. KHANNA. Thank you.

The witnesses will be unmuted so we can swear them in.

Please raise your right hand.

Do you swear to affirm that the testimony you are about to give is the truth, the whole truth, and nothing but the truth, so help you God?

Ms. HAUGEN. Yes.

Ms. BOYD. Yes.

Mr. DOUGHTY. Yes.

Ms. SCHATTMAN. Yes.

Mr. LACEFIELD. Yes.

Mr. KHANNA. Let the record show the witnesses answered in the affirmative. Thank you.

Without objection, your written statements will be made part of the record.

With that, Ms. Haugen, you are recognized for your testimony.

STATEMENT OF BONNIE HAUGEN, OWNER, SPRINGSIDE FARM

Ms. HAUGEN. Thank you.

Chairman Khanna, Ranking Member Norman, and members of the subcommittee, thank you for the opportunity to speak today.

I am Bonnie Haugen, and I believe that farming is truly everybody's bread, butter, and water. I had a raindrop on my head this morning. Keep that in mind, and the significance will come to that in my last paragraph.

In southeastern Minnesota, in hilly karst geology, 50 miles from the Mississippi River, my family runs a grazing dairy business with a seasonal herd of 160 cows. On our 270-acre farm, we use rotational grazing, and our cows graze on pasture with forages that includes grasses, clover, and more. These forages sequester carbon and keep soil from eroding by wind or water.

My passion for farming and environmental stewardship has led me to be involved with several different organizations, including

Land Stewardship Project, Campaign for Family Farms and the Environment, and other groups. I'm also a part-time Dairy Grazing Apprenticeship, or DGA, education coordinator and a certified farm transition coordinator with International Farm Transfer Network. But I'm representing myself today.

Until 2011, I did the management, feeding, and most of the milking on our seasonal herd averaging 130 cows. My husband worked off the farm and supplied health insurance, which is a typical arrangement for farmers today. In 2011, our son, Olaf, came home to manage the dairy. Currently, on our farm, I do the bookwork and grandchild care when needed. Three of the grandkids, ages 8, 6, and 3, want to farm. I want them to have the opportunity to farm without being a serf to corporate ag.

When we bought these acres 29 years ago, there were about 12 dairy farms within a three-mile radius of us. Now there's only one other dairy with approximately 400 cows aside from us. What I have seen in my community mirrors national trends. In 1970, there were about 620,000 dairy farms nationwide, and now there's only 32,000 dairies or less, or about 19 percent.

The pressure of corporate ag and CAFOs, which are Concentrated Animal Feeding Operations, on the dairy sector in my community has taken away a fair opportunity from the neighbors who wanted to keep or pass on dairy farming.

Corporate dairy farms also often use management actions that threaten the safety of our water and air. These operations concentrate millions of gallons of liquid manure in one spot, which is risky, especially in this karst area. I really think that a moratorium on any new CAFO dairies is a good idea for the milk markets and our communities. Please remember that big CAFO dairies are not the same as ours. They're like big box stores similar to a Walmart building in the middle of one of our small towns.

It's also important that sustainable farming practices are supported. Our unique farming methods have helped us survive difficult times on the farm and benefit the environment. Our cows live outside, walk to the barn for milking, and go back out to the paddock to get most of their feed and leave most of the mature in the paddock, which is a specified fenced area, where it will start to benefit the soil, soil bugs, dung beetles, and plant roots right away. The cows get a new paddock area after each milking twice a day. Studies, such as Grassland 2.0 at the University of Wisconsin, show that perennial pasture, like the pasture, we have grown, is the best crop for carbon sequestration and also increases water infiltration, which benefits water and soil quality.

I'm submitting research studies and some comments from some of my colleagues in my written testimony, and please give them at least a skim.

Now, Federal programs such as the Conservation Stewardship Program help farmers understand and benefit from implementing regenerative practices. I urge you to support increased funding for them.

Now, this summer, whenever you might be caught in a rain shower or thunderstorm, I challenge you to remember this: The raindrops landing on you may have landed on my cow's back, fallen down in the grass, soaked into the ground, followed a karst crack

in the St. Peter aquifer. Then my neighbor's confined cow drank it, passed it on into their slurry store, then out to the cornfield, but before it could soak through the dry crust, it was carried with a deluge into the stream, the creek, the river, the ocean, then evaporated to the sky where it connected with other drops while floating in the wind, the wind currents being carried over your head, clinging to other raindrops and getting too heavy, so it drops on you.

And there's supposed to be a picture of drops. There we go. There it is.

We are all so interconnected. What I do on my hills truly does affect water quality and quantity for all of society, and farming truly is everybody's bread, butter, and water.

Thank you.

Mr. KHANNA. Thank you.

Ms. Boyd, you are recognized.

STATEMENT OF KARA BOYD, PRESIDENT, ASSOCIATION OF AMERICAN INDIAN FARMERS

Ms. BOYD. Honorable Congressman Khanna, Ranking Member Norman, and committee members, it's truly an honor to be invited to speak with you here today. Thank you.

I'm Kara Brewer Boyd, an enrolled member of the Lumbee Tribe of North Carolina. My Tribe is the largest Tribe east of the Mississippi and the eighth largest in the United States. My Tribe is located in southeastern North Carolina down along the South Carolina border, and we have been producing agriculture for centuries.

My husband is John Boyd, the founder and president of the National Black Farmers Association. My husband and I maintain 1,500 acres in Southside, Virginia. Our agriculture production includes corn, soybeans, wheat, hemp, summer vegetables. Our livestock production includes beef cattle, meat and dairy goats, chickens, and hogs.

The Association of American Indian Farmers has about 3,500 members across the United States in which I serve as their founder and president.

Being an indigenous person here in North America, I highly value food security and resiliency. As we have always found food to feed our families, travel communities, and others, indigenous people understand being a good steward of the land includes making decisions with forethought of future generations.

The COVID–19 pandemic, the war in Ukraine, and increasingly extreme weather conditions have each contributed to bringing us into a farm crisis, which may lead to a food crisis in the very near future, and which threatens the longevity of our agricultural system as well as our national security and food supply.

Yet, underpinning all of this, playing arguably the biggest role in the farm crisis and our collective future, is our soil. Regenerative agriculture is a critical solution to the farm crisis. Combining indigenous knowledge, holistic, adaptive, and cutting-edge science, it puts forth six key principles that allow any farmer or rancher to restore sole function.

The principles are: context, least disturbance, living roots, soil armor, increased diversity, and animal integration.

Regenerative agriculture increases the resilience of our land and profitability for producers, but, unfortunately, Federal policies, including the farm bill, currently are not supporting farmers and ranchers in this transition.

On behalf of our regenerative farmers, Mr. Chairman, and members of the committee, you have the opportunity to foster this change. The House Oversight Committee should be aware of these problems, profound problems, that are detailed in my written testimony, as well as you're hearing from the other witnesses, and their root cause, as well as the solution and opportunity that lies in regenerating the soil beneath our feet.

We're living in a time like no other, and we need science, technology, indigenous wisdom, and holistic thinking, working together to move us toward regeneration. Building back soil health is the most cost-effective Federal investment we can make at this time. From risk mitigation to farmer prosperity, to human health to carbon sequestration, it is a win-win for all. And this committee can help secure regenerative agriculture moves us forward as a critical comprehensive solution to the farm crisis.

Thank you again for this opportunity, and I look forward to your questions.

Mr. KHANNA. Thank you, Ms. Boyd.

Mr. Doughty, you're now recognized.

STATEMENT OF DOUG DOUGHTY, GRAIN FARMER AND CATTLE PRODUCER

Mr. DOUGHTY. Chairman Khanna, Ranking Member Norman, and members of the committee, I appreciate the opportunity to be here today.

I'm Doug Doughty. Barb and I grow corn, soybeans, and hay, along with a cow-calf operation in north Missouri. I returned to our family farm during the eighties' farm crisis. Little did I know another crisis was unfolding and is continuing to gain strength today, the proliferation of large-scale, industrial CAFOs.

From where I stand in my 38 years of farming, industrial agriculture nutrient pollution, such as nitrogen and phosphorous, is increasing due to runoff and leaching of animal manure and fertilizer from our fields. And Concentrated Animal Feeding Operations, CAFOs, are escalating, both posing environmental threats to our rural communities, our urban neighbors, and even the Gulf of Mexico.

There is less soil. There is less topsoil, more carbon in the air, and more agriculture-related greenhouse gas emissions than yesterday. Overall methane emissions have declined since 1990, but agriculture-related methane emissions have risen, a 71-percent increase. EPA ties this growth of emissions to hog and dairy factory farms. The sophisticated CAFO industry is highly dependent on cheap feed and avoiding environmental regulations, pushing Earth, farmers, and animals to their limits. Recent state assessments show a laundry list of water bodies impaired with bacteria, nitrates, and phosphates.

We raise cattle. I grew up raising hogs, was a pork producer in my early farming years. I understand what is involved raising animals for food, but what CAFOs do is different than what we do on

our farm. Buildings the size of football fields concentrate thousands or tens of thousands of animals and create massive amounts of manure in quantities equivalent to cities, a challenge to be handled responsibly, putting surface and groundwater at risk of contamination.

We need more effective CAFO regulations to counter this massive environmental impact. It's past time to regulate the waste and air pollution. Let's bring nitrogen and phosphorous inputs in line with crop needs, an easy way to improve water quality. Let's stop over applying manure and fertilizer, less excess to wash away.

EPA has identified phosphate and nitrogen farm runoff as a serious threat to the public's health and call for identifying those responsible.

In 1997, our county enacted a local health ordinance to govern CAFOs. The ordinance did not ban CAFOs but was stronger than state regulations. The 20 Missouri health ordinances fell victim to intense lobbying from corporate agriculture in 2019, another domino to fall in a series of laws to deregulate the industry.

We were taking a reasonable approach, but the attack on local control takes that tool away, and our state government, commandeered by corporate ag, has eroded state protections and regulations on CAFOs to near the EPA baseline. Weakening state rules are described as coming in line with Federal regulations.

Shortly after the overturn of our health ordinance, we resisted a 10,500 head industrial sow CAFO proposed near the 6,000-acre Poosey Conservation Area. We knew the impact it would have on the neighborhood, dealing with air and water pollution, health issues, flies, noise, and truck traffic, plus the burden on our deteriorating highways and county roads, and, finally, the potential harm to the conservation area, an important public land, natural resource destination for recreation. This was not opportunity knocking.

This CAFO was going to produce feeder pigs for JBS, the Brazilian multinational, the largest meatpacker in the world. How would JBS be held accountable? Other Missouri communities deal with pollution issues from industrial CAFOs run by China-owned Smithfield. China and Brazil get the pork. We get the manure and environmental issues.

The permit was withdrawn for now, but Missouri is determined to provide minimal protections. Recently, our DNR removed perched water from the definition of groundwater. Shallow groundwater had been discovered on the aforementioned proposed CAFO site. Often perched groundwater is our only source of groundwater that is reasonably available. Curiously, the definition change applies to CAFOs, not other industries, such as landfills and mines.

Federal regulations of CAFOs are weak. The EPA doesn't have regulations in place to protect us from CAFOs, but EPA is our last line of defense.

In the meantime, our own USDA funds CAFOs to pay for manure lagoons and animal mortality facilities. Why is USDA underwriting pollution with conservation dollars? Let's direct a larger percentage of USDA dollars toward small and midsize family farms seeking to implement cover crops, sustainable livestock practices, farmers' markers, farmers selling directly to consumers, or urban

ag projects and neighborhood kitchen and grocery initiatives. Let's fund resourceful farming and food initiatives that contribute to the public good.

Thank you.

Mr. KHANNA. Thank you, Mr. Doughty.

Dr. Schattman, you're recognized.

STATEMENT OF RACHEL E. SCHATTMAN, ASSISTANT PROFESSOR OF SUSTAINABLE AGRICULTURE, UNIVERSITY OF MAINE

Ms. SCHATTMAN. Good afternoon, Chair Khanna, Ranking Member Norman, and members of the subcommittee.

My name is Rachel Schattman, and I serve as an assistant professor of sustainable agriculture at the University of Maine, an R1 land, sea, and space grant institution.

Before I begin, I would like to say thank you to Representative Khanna for the invitation to testify and to the National Sustainable Agriculture Coalition, which helped invite me here today.

We're in this hearing because every agricultural sector in every region of our country is already being affected by climate change in some way, and the impacts are intensifying. This is a long-term problem with consequences for us all. Even if we were to stop putting greenhouse gases into the atmosphere today, we would see temperatures increase throughout the country and beyond with cascading effects on precipitation and other weather patterns. These weather patterns in turn affect the balance of agroecosystems which our communities of plants, insects and animals, diseases and, importantly, the interactions between all of these.

Though there are many uncertainties associated with what the future holds, because of research that has already been conducted, we know enough right now to support farmers as they adapt to a changing climate, build resilience into their farms, and anchor thriving U.S. agricultural industries so that they can provide essential rural jobs and feed our population and the world.

We can do this through unwavering support for sustainable regenerative agriculture through evidence-based programs and policies that meet farmers where they are and provide what they say they need to move forward, which I touch on in my written testimony and based on my own research and past work with diversified farmers in the Northeast and wheat farmers in Kansas.

To farm sustainably means that we grow food, fiber, and fuel in a manner that does not undermine our ability to do so in the future. To farm regeneratively is to do this in a way that has a positive effect on natural resources. This term is often used in the context of sequestering carbon, improving soil health, or improving water quality through agriculture management activities.

Specific practices guided by these principles include reduced or no-tillage, cover cropping, crop rotation, and integration of livestock into cropping systems. These practices also have the added climate mitigation co-benefit of sequestering carbon in soil when they are implemented over an extended period of time.

Other practices, such as managing manure and amending animal feed, alternative wetting and drying of fields in rice production,

and only using the most efficient irrigation and fertilization practices have the benefits of reducing nitrous oxide and methane emissions.

How to increase the use of sustainable regenerative farm practices across different agricultural sectors is a question for behavioral science. My research on adult education in agriculture and forestry specifically related to climate change led to a program called the Climate Adaptation Fellowship. This program was based at the University of Maine and co-led by the USDA Northeast Climate Hub and the Rutgers Climate Change Institute. We piloted it last year with vegetable and small fruit growers in the region and the agricultural advisers who work with them. Together pairs of fellows completed on-farm risk assessments and adaptation planning, put key adaptation approaches into place, and engaged in peer-to-peer learning. And this is just one example of an effort to create learning communities where farmers can support one another to pursue sustainable and regenerative practices and keep using them.

Support for farmers to learn and apply adaptation and mitigation practices has been provided to a limited degree by Federal and state and private programs in the past, but there's room to do more. Many past efforts have been piecemeal, and they are not universally acceptable to U.S. food, fiber, and fuel producers.

For agriculture to meaningfully contribute to addressing climate change, we need a unified approach, supported and sustained by Federal policy and investment, and complimentary community and state resources. This means heavily investing in agricultural research, especially at land grant universities, including historically Black colleges and universities and Tribal colleges, and expanding education programs, technical assistance, and financial assistance for farmers.

There are many sound evidence-based recommendations in the 2020 report by the Select Committee on Climate Crisis, which are also included in the Agriculture Resilience Act, H.R. 2803, put forward by Congressman Pingree of Maine and cosponsored by the subcommittee's chairman. Passage and funding of these initiatives would accelerate our ability to adapt to and mitigate climate change through agriculture.

We must also ensure that Federal agriculture programs are available to all who steward the land. In addition to climate change being a matter of science, it's also invariably a racial, gender, and economic justice issue as the negative effects of climate change will fall disproportionately on those who can least afford it.

To minimize the future harm to our country, we should bring Federal policy to bear on extending and expanding how U.S. agriculture adapts to and mitigates climate change. The health and well-being of our people and the agroecosystems that feed us demand it.

Thank you.

Mr. KHANNA. Thank you. Thank you, Dr. Schattman.

Mr. Lacefield, you are now recognized.

STATEMENT OF BRIAN LACEFIELD, DIRECTOR, KENTUCKY OFFICE OF AGRICULTURAL POLICY

Mr. LACEFIELD. Good afternoon, Chairman, Ranking Member, members of the subcommittee, and other witnesses.

Throughout my career, I've worked directly with Kentucky farmers in multiple capacities. I've worked with the University Extension Service, as a banker, as a crop input retailer, and most recently as state executive director of the Farm Service Agency. Each role has provided me with a unique view of the farmer's decision-making process. The topic we are covering today is very broad and difficult to find a one-size-fits-all solution.

Regenerative ag and agriculture technology, while newer names, are not new concepts. Throughout our history, there has been a push for efficiency and sustainability. Our human nature has driven us to find new and innovative ways to maximize production and limit resources used. This has driven the evolution of our agriculture industry.

The first agriculture technology advancement was possibly a simple stick, allowing tilling of the soil, establishing better seed-to-soil contact, and establishing the plant where we wanted. This has continued to evolve over time with technology advancements. As technology advances, the costs must be weighed. Practices must be sustainable both economically and agronomically. We have learned as our industry evolved that there are both short-and long-term costs to production, and we must balance production practices with goals of preserving resources for the future.

Kentucky farmers have been pioneers and early adopters of conservation and regenerative practices. The land we work has driven the need for this. Early work with terrace farming in Kentucky was studied during the Dust Bowl. No-till farming was started commercially in western Kentucky by a progressive farm family working with the University of Kentucky. Today it is a widely utilized practice throughout the world, as it balances agronomic and economic sustainability.

Kentucky agriculture had a paradigm shift in 1998 with the Tobacco Master Settlement. The individual states had sued the tobacco companies for Medicaid health costs related to tobacco consumption. At this time, more than half of Kentucky's farmers raised tobacco. This was over 48,000 farm families in our state. Tobacco receipts accounted for 25 percent of our farm gate receipts.

Agriculture leaders and members of our state legislature had the foresight to understand the impact to our producers in our rural economy. In 2000, Kentucky's Office of Agricultural Policy was created, and half the available funds were dedicated to be invested in agriculture. The investment was established to provide economic incentives to diversify Kentucky's agriculture and to grow our farm income. Twenty-two years later, our General Assembly continues to dedicate 50 percent of available annual master settlement agreement payments to agriculture.

To date, nearly $700 million have been invested in Kentucky agriculture. The majority of these investment dollars have had a cost-share component, so well over a billion dollars of public-private investment have been made for this purpose in Kentucky. The result is Kentucky farm gate receipts have more than doubled. Our to-

bacco dependence has declined from 25 to 4 percent of income, and we have declined from more than 50 percent of Kentucky producers raising tobacco to now we're just slightly over one percent.

The most popular program that we currently administer is a menu-based cost-share program covering 11 different investment areas. Each producer can find items that are based on research and best management practices to utilize. There's a producer education component required for participation and a requirement to have a water quality claim. This program has had a very high participation rate across the state and repeat annual applications. It is a purely optional plan, and a great distinction has been built in to be the economic carrot to best management practices and not a subsidy.

Many of the items available for cost-share participation are consistent with several of the principles of regenerative agriculture: enhancing and improving soil health, improvement of water quality, optimization of resource management.

The optimization of resource management is of critical concern as our producers are facing many challenges in our current market. High input prices, global disruption of markets, challenges finding labor, and rising interest rates are putting intense pressure on our Nation's farmers and ranchers.

As I was preparing for this meeting, I went to the University of Kentucky Ag Econ website. The first link was for information related to financial and mental stress. Our producers need our help as we navigate these challenging times. Additional regulations or production mandates would cause detrimental stress. I share the examples of my agency as a way we can work toward offering elective incentives for practices that are proven to be agronomically and economically viable.

I appreciate the opportunity to visit with you today. I'm happy to discuss these points and any additional topics you have as questions.

As we move our industry forward, it will take the collective work of a diverse group of stakeholders, and I look forward to the discussion. To quote my favorite Kentucky chef, Ouita Michel: There is room at the table of agriculture for everyone.

Thank you.

Mr. KHANNA. Thank you, Mr. Lacefield.

I now recognize myself for five minutes of questioning.

Farmers know the difference that regenerative agriculture makes. Many of the environmental and economic benefits of regenerative agriculture are not quantified or taken into account in policy decisions. The U.S. Department of Agriculture can support rural communities through regenerative agriculture and paying farmers for those practices.

Ms. Haugen, how does regenerative grazing improve water and air on your farm?

Ms. HAUGEN. Thank you, Chairman Ro Khanna.

How does regenerative agriculture improve the water and the soil on my farm?

Mr. KHANNA. Yes.

Ms. HAUGEN. Did I hear that question correct?

Mr. KHANNA. Correct.

Ms. HAUGEN. Regenerative agriculture differs a little bit from sustainable agriculture. The terms are similar. Yes, many things are similar. But I believe when people talk about regenerative agriculture, we are focusing on looking and really seeing what is happening and being more interactive with our thoughts and not just actions.

So, in regenerative agriculture, we look closer at the soil and think more about how the manure acts with the soil. Oftentimes the liquid manure that is put on from a CAFO has already sat for a long time, and when it comes on as liquid, it may run off, just does not have quite the same consistency as when a cow drops their cow paddy on the hillside and, because of its consistency, it does not run off. It sits there. It doesn't take long before the dung beetles come in and start acting and the other microbes start acting, and it just starts to happen right away. That's a regenerative agriculture type of thing that starts rebuilding the soil right away.

When our soils are rebuilt, we have better water holding capacity, which means the water does not run off. It's there, and it stays there so we are better prepared for a drought.

There are reclamation examples of reclaiming desert type of places if you look in "Conquest of the Land Through 7,000 Years," the NRCS publication. Another way is that regenerative agriculture, if we don't over concentrate our animals or manure in any one spot, my vet once told me years ago, Dilution is the solution to pollution. Whether we talk about cow numbers, I don't think that's as important as cow density and how we handle our land and how we handle the manure. That is really more of the issue than my 200 cows versus 10,000 cows, though there are plenty of studies where ten 1,000 cows are more beneficial to a community than one 10,000-cow dairy. That's——

Mr. KHANNA. Thank you——

Ms. HAUGEN [continuing]. Answer that——

Mr. KHANNA. Thank you——

Ms. HAUGEN [continuing]. Dr. Rich Levins, Ken Meter, and John Ikerd, that have more valuable information on answering that question with details than mine.

Thank you.

Mr. KHANNA. That was a great answer. Thank you, Ms.—thank you for that.

Let me ask a question. Short answer if you could, Dr. Schattman. How can farmers help us avoid the worst of the climate crisis? And would paying them for regenerative practices help?

Ms. SCHATTMAN. I do believe that paying them for good stewardship practices would increase use across the landscape. I don't think it's the only way to motivate people to use some of these practices, but I think it's a powerful tool.

Mr. KHANNA. I appreciate that.

And let me ask a question of Mr. Lacefield. You know, we have a bill that is bipartisan that would give the Department of Agriculture a hundred million dollars to boost domestic production for fertilizers, the quickest and most sustainable fertilizers.

Would you support something like that?

Mr. LACEFIELD. Well, I, obviously, would want to know all of the details in the bill. But, from the way you describe that, yes, I know

the sourcing of inputs has been an incredible challenge for producers this year. This for sure in nominal terms, and if not real terms, is the most expensive corn crop in history established. And I know one of the concerns where we have no way to fix things, we have a problem and have to go back with different inputs because if we were able to get it, we had just enough.

I've read some of this. I'm not sure how it all works to do this because, like we heard in some of our comments about the concentration in our livestock processing, we had the same issue with the large suppliers of our inputs.

Mr. KHANNA. Thank you.

I now recognize Ranking Member Norman for five minutes of questions.

Mr. NORMAN. Thank you, Chairman Khanna.

Let me ask those of you on the farm that, I guess, make a living farming, the regenerative agriculture if it includes in your practice no-till farming and the restrictions of pesticides.

Ms. Boyd?

Ms. BOYD. Yes, it does. I am a no-till farmer, and we've reduced the amount of pesticides. We try to only spray and use them when we need to. And it's something that is very challenging, but we find that with the no-till, we don't have as much weeds, but we still have some weeds.

Mr. NORMAN. How does the plant get root generation if you don't—do you not till at all?

Ms. BOYD. Right. With the no-till, you're still growing that seed. You can set the depth on the no-till grain drill to about a half an inch to an inch, so you're still getting——

Mr. NORMAN. Is it on top of the weeds that—or do you do—how do you handle the existing weeds that grow during the year?

Ms. BOYD. Well, that's the challenge with some of that that's in my written testimony because we don't have the fencing, and so we——

Mr. NORMAN. You don't have the what?

Ms. BOYD. We don't have perimeter fencing so we can bring in our cattle and the livestock integration which would help suppress the weeds to——

Mr. NORMAN. So you plant seed on top of the ground that has not been tilled and get a good root system?

Ms. BOYD. It hasn't been tilled, but we spray. And that's where we want to have more supportive-funded agriculture for regeneration where we don't have to do a burndown, a chemical burndown, to kill those weeds because we want to cut back on the use of those chemicals.

Mr. NORMAN. How deep is the soil that you're planting in if it hasn't been tilled?

Ms. BOYD. With our cultivators, the no-till cultivators, we're getting our seeds between a half an inch to an inch in the ground.

Mr. NORMAN. And you're getting a root——

Ms. BOYD. We get good root, and we get on average——

Mr. NORMAN. Do you make your living farming?

Ms. BOYD. Yes, sir.

Mr. NORMAN. OK. Let me ask, Dr. Schattman, have you—I guess you're in favor of no-till farming and reduce—the outlaw of all pesticides?

Ms. SCHATTMAN. No. No, that's not my perspective at all, sir. I think it can be used judiciously and conservatively. And I think in sustainable and regenerative agriculture, it's important to have all of the tools in our toolbox but to use those that we know have negative environmental consequences very carefully.

Mr. NORMAN. OK. Mr. Lacefield?

Mr. LACEFIELD. Yes, sir.

Mr. NORMAN. Mr. Lacefield?

Mr. LACEFIELD. Yes, sir.

Mr. NORMAN. Would you—the no-till conversation and the no pesticides, what are your thoughts on that?

Mr. LACEFIELD. I think it would be very difficult. That's one of the tradeoffs to what we have with no-till is you're shifting to a herbicide form of reducing the weeds. So it would—you're trading soil disturbance for utilization.

But I think Dr. Schattman made a very good point about you have to have all of the tools in the toolbox and then figure out the most efficient way to deploy them. As I mentioned, I've been in the crop retail, input retail business, and I can tell you producers do not want to use any more than they have to. And that's where I think we have opportunities for precision agriculture to where we're able to utilize the right product in the right place at the right time and, most importantly, at the right amount.

Mr. NORMAN. OK. Bonnie Haugen?

Ms. HAUGEN. Haugen, thank you.

Yes, I would agree with all of what I've heard so far. To do the details of that, my son who is currently managing our farm——

Mr. NORMAN. Very briefly. Bonnie, very briefly. I'm running out of time.

Ms. HAUGEN. OK. Refer to my printed testimony.

Mr. NORMAN. Ms. Haugen, very briefly, do you agree with the no-till farming and the reduction of pesticides?

Ms. HAUGEN. Yes, there are better ways than no-till farming, and, yes, I agree with it.

Mr. NORMAN. OK. I guess my main questions—and I've got 39 seconds—I've have never—and I don't do this for a living. I'm a recreational farmer, but I've never had a root system that when you throw the seed on top of the ground that hasn't been plowed, I don't understand that. I don't know how you get the yield that you're getting. The issues that we have with—facing now that I mentioned in my opening testimony, we're going to have farmers who are not going to be able to exist anyway. And I guess we'll have to grow them in China or let China grow the food because, unless we can supply fertilizer, unless we can get fuel and other basics to the farmers, they cannot exist. That's the information I'm getting back. And when you cannot get feed to feed your pullets, in the case of chickens, we've got a severe problem.

Thank you all for your testimony. I yield back.

Mr. KHANNA. Thank you.

I now recognize Representative Gibbs for five minutes.

Mr. GIBBS. Thank you.

First of all, I'm going to tell you I'm from Ohio. I'm going to tell you a little bit of how we do things in Ohio.

I was a full-time farmer before I got this soft job in the legislature and Congress.

First of all, there's some comments made about the CAFOs and EPA. When I was in the legislature in Ohio years ago, the EPA, the U.S. EPA does have jurisdiction over CAFOs. Usually most states go through their state EPA. We changed that and made it the Ohio Department of Agriculture. We have a very strict regulatory framework in Ohio, and we've actually shut down a couple of large CAFO farms in my time in the legislature. We had an egg farm that was just a disaster, a huge farm. They were producing two percent of the eggs in the United States at the time. We shut them down.

Another misconception I think, Mr. Chairman, is a lot of people think CAFOs, large farmers are corporate farms. Well, in Ohio, they're really not. They're mostly family farms. And, you know, it's all about economics of size. You know, when a combine now they tell me costs well over a million dollars, you have got to have more base to produce these crops, and the machinery, you have to spread that over more acres. And so we've got family farms. There might be two or three families involved, but they're all family farms for the most part.

And the question of Ranking Member Ralph Norman talking about no-till, I have been growing no-till corn and beans for probably 30 years now every year. You've got to watch it. You can have a disaster if you're not on top of it, but the no-till, it does work. You know, the planter goes through there. It plants it around about an inch deep, and the coulter goes over it and presses it down and makes the seed bed. And you cannot grow no-till anything without herbicides and pesticides.

And I would argue that, with the no-till technology and the seed technology, we use less herbicides than we did before, and they're safer. You know, one of the problems, years—is what you call legacy herbicides that we used back in the fifties and sixties and the early seventies. They stayed around. They didn't break down the soil. Our herbicides we're using—and Roundup being one of them—they're a contact herbicide that don't do much on the roots, and they break down the soil, microbes that they break down, and it's actually more environmentally friendly.

And there's no way that we can produce enough food in this country and also feed the world like we've done in American agriculture without commercial-type production. I know some people will say factory farms. You know, that's kind of, I think, a misnomer. But I would argue too, we have to have farms of all sizes. And the smaller farms, you know, the 100-cow dairies, or whatever you wanted to say, a lot of them in my area, they found niches. They might be organic producing. But if we're all trying to produce—I used to raise a bunch of hogs. And if we were trying to raise them all out on the open, out on the pasture, we wouldn't have been able to have much production, and we wouldn't be, you know, feeding the world like we need to do.

Technology has improved yields. Part of this hearing is increasing food production. In 1950, the average production for corn in the

United States was 50 bushels to the acre. When I started farming in 1975, our goal was to have a 100-bushel corn crop. Now we're 200. And I would argue that we're doing it more environmentally safer and protecting the ground and the soil because most of it, in my area anyway, is no-till.

When I first started farming, we couldn't grow beans, soybeans, because we have—we're in rolling hills. We have highly erodible land. With no-till technology, everybody in our area can grow soybeans now. So we've got—and my dairy farm operations really impress me. We have large dairies, you know, 1,000-cow plus dairies, family owned, family run. And they get a lot of double cropping because they go in there, and they will take off a corn crop or a bean crop in the fall. Then they'll plant rye, and they'll take that off. And in the early spring, you can get a corn or a soybean crop in. You got double crop, and you get that green manure fertilizer. And this notion about farmers are putting too much pesticides on, too much fertilizer, spreading too much manure is really ridiculous. At the price of fertilizer, you think we're just going to go out and spread too much? I mean, it just doesn't make sense.

You know, as farmers, we don't set our prices. You know, we try to hedge, and we try to form a contract and do the best we can. But, you know, we have to take what we get. And there's so much going on in the industry with vertical integration and contracting, that's just kind of a natural progression because of the cost and the size of the environment, how things go up.

So I could go on and on, but I wanted to say that I think we are protecting the environment. We do it right. And in Ohio anyways—I can't speak for the rest of the country. But, in Ohio, we have a strong regulatory framework for the CAFOs, thousand animal units and larger, and we have a history of shutting them down when they don't do what they're supposed to do. And they have to really manage that manure, and they're really supervised about how they do that and the recordkeeping they have to—and they of have to put those records to ODA.

And I think every state should have their Department of Agriculture doing this for their CAFOs and not the EPA because the problem—just a second here on my time. The problem we have in Ohio, we had the EPA folks coming in there trying to regulate CAFOs, and they didn't know anything about it. They would walk into a farm, and they'd make—ask questions of Congress that they had no clue, and they were the regulators. And so when we had the agriculture people—and some people might say that was the hem and the haw, you know, the fox in the henhouse, but it's not true. You know, we want to make sure our that our farmers in our agricultural communities in Ohio are doing the right thing because we are a very diverse state, a population of 11.3 million people and, you know, we have close neighbors, and we have to do the right thing.

And, you know, to get this done, we have to make sure that we're doing a good job, but we do need to have the pesticides, herbicides, and the seed technology and the other technology that goes with it. And we've increased in our yields, and we are drawing a lot more—we have a 14 billion bushel corn crop I think in the last couple of years. Years ago, a 10 billion bushel crop would be a dis-

aster, and we're doing that in a lot less acres than we were doing before as everybody knows. So it is sustainable, and I think it is regenerative, and it's important to get it done.

I've gone way over my time, so I yield back. But I want to make those points, that the biggest conservationists and environmentalists, I believe, is the American farmer because they live on that land and they drink that water first. And I can attest to that because I've been living on farming for almost 50 years now, and I understand that.

So I yield back.

Mr. KHANNA. Thank you. I want to recognize the Ranking Member Comer.

Mr. COMER. Thank you, Chairman Khanna.

Mr. Lacefield, as you know, farmers innovate with precision agriculture technology with methods that collect and analyze large amounts of data to determine the kind and amount of inputs like fertilizers, water, pesticides, and what they're actually needed for crop management. These methods can include using GPS guidance, control systems, sensors, robotics, drones, automated hardware and software.

How have these advances in technology impacted farming communities in Kentucky?

Mr. LACEFIELD. Thank you, Congressman. Greatly. This has—we've been talking all day today, it's been about the allocation of resources, and this has been the continued evolution of our industry. We started off, we used to farm by the field and then—then we are now farming by the 2-acre grid with precision ag, and we're going to advance to the point we're going to be farming by the inch to where we'll be able to best utilize these practices.

This precision technology that we're talking about is the ability to select where you're putting the input. So where you have a higher productive piece of ground, you're able to increase the seed rate there and reduce it in others that are not going to produce this. You're able to apply the fertilizer at a variable rate so it's not a broadcast across the field. So it is more efficient. It returns more to the producer and is better overall for the environment.

Mr. COMER. And it does—that's a good point. It obviously helps the environment as well as will make the farmer more efficient.

How can the U.S. Government support precision agriculture?

Mr. LACEFIELD. Well, I think the market is going to continue to drive this as you're seeing with input prices going up. But, from the Federal Government standpoint, it goes back to what my comments were earlier. You know, you want to see a behavior increased, you create an incentive for that.

So I think it's to try to be able to get a point for the farmer to try that. That's what I like about our programs that we're currently running. They give that economic incentive, some of them 15 cents on the dollar, 75 cents on the dollar to try our practice, and then they usually see it works, and they continue it on their own.

Mr. COMER. Now, Mr. Lacefield, I have to put a plug in for the Princeton Kentucky UK Ag Research Center. Your dad was a huge part of that, one of the experts in forage research, and I know you're very familiar with that as well. Would you agree that the

availability of pesticides has improved all types of farming in the last 50 years?

Mr. LACEFIELD. Absolutely. As research, we continue, we're evolving, and that's another reason, to piggyback on the last question, is continued investment from the Federal level in research so we can be able to illustrate this to producers that it makes more sense and to utilize these products.

Mr. COMER. I ask that because there's a lot of concern among agriculture, as you know, that this administration and this EPA want to ban certain types of pesticides, insecticides, fungicides that are crucial to agriculture. And, you know, my concern is that we could have a scenario with our food, if we let the government step in and dictate pesticide applications, insecticide application, like the government stepped in with the FDA and shut down that baby formula factory and then walked off and left, and we had a 36-percent shortage in baby food because that plant produced a third of the baby food—baby formula in America. If we tinker with production agriculture, I fear that the same thing could happen with our food supply that happened with baby formula.

Let me ask you this, Mr. Lacefield—last question here—farmers in Kentucky and all over America are outraged because of strict climate rules. What policy measures, if any, would satisfy a farmer attempting to maximize crop yield efficiency and profits but still obviously support the environment? Because I agree with what my colleague and former farmer, Representative Gibbs, said; I think the farmer is the ultimate conservationist. But what policy would satisfy farmers that could also hopefully satisfy the Americans who are concerned with the environment, like I am?

Mr. LACEFIELD. Well, we all are concerned with the environment, and I think that's been the consistent message from every witness you've heard today is putting the decision back on to the producer and the farmer. The greatest source of wealth on a producer's balance sheet is going to be their land. They're going to protect that asset.

Mr. COMER. I agree. And I, again, appreciate you and the other witnesses for taking time to testify today.

And, Mr. Chairman, I yield back.

Mr. KHANNA. Thank you.

I recognize Representative Fallon.

Mr. FALLON. Mr. Chairman, thank you very much.

I'd like to start by thanking the—all the witnesses for coming here today and sharing their insight on a topic obviously of great importance to our country.

You know, when this Nation was founded, you have to look back, and as we were rising to prominence on the world stage, one of the most critical foundations that we had was agriculture, of course. And American farmers and ranchers today are helping feed 800 million people; we are the net exporter of food, and without us, humanity would be suffering from chronic hunger.

And, according to the United States Agency for International Development, our Nation spent $8 billion in emergency and development food aid across the globe since 2018, I mean just in the last four years. Much of the food was grown right here in American soil.

As the rural population continues to grow and the urban areas spread into arable land, the need for food will continue to rise.

Democrats have cited an academic paper from 2011 that anticipates that the global food production must rise at least 60 percent to feed the world by 2050. I have no doubt that American farmers and ranchers will be able to meet the needs of our Nation and export their surplus abroad.

According to the American Farm Bureau, 30 years ago, the United States agriculture sector would need—would have needed 100 million more acres—100 million more acres to meet the production levels required for today's food supply. But, through innovation, they got there. The reason that our ranchers and farmers were able to meet the goals is because of sound farming practices and sound grazing practices coupled with advanced agriculture technologies, and that can't be understated.

Mr. Biden's so-called American Families Plan would have done even more damage to the American farmers and ranchers. Democrats attempted to end the like-kind exchanges and the step-up in basis and bring back the wealth transfer tax, which would've quite literally brought an end to American farms across our country.

Today Democrats are attacking the farmers and ranchers calling them the great polluters of the world, blaming them for the environmental calamities that the world is facing and demanding that we do more to stop climate change. It's a dangerous game when D.C. politicians think they know better than the folks that are actually putting their hands in the dirt.

Regenerative agriculture practices have applied—have been applied by ranchers and farmers across the country for decades. They know the land. They know the environment far better than us. It's their business and their bottom line. The American farmers and ranchers have potential to feed the world—we already know that—and we should not be holding them back.

So I have a question with the time I have remaining. Mr. Lacefield, as you know, farming and ranching operations in the country are as diverse as the geography on which they operate. Certain regions, like the Dakotas, for instance, have barely enough moisture to produce their primary crops let alone a cover crop.

Hypothetically, if Democrats began mandating for the sake of carbon caps covered crop requirements on all U.S. farming operations, how would arid regions be able to accommodate such pressures?

Mr. LACEFIELD. I think that's the problem. You can't make a one-size-fits-all program. The years I served as the state director for the Farm Service Agency, I would get phone calls all the time about a new policy that we were rolling out about how it did not work specifically for one farm in Kentucky. And that was the one time in my life I enjoyed being able to use the phrase: It is simply an act of Congress to change it.

So one size does not fit all.

Mr. FALLON. In your opinion, sir, is it feasible for Democrats to mandate cover crops to ban certain EPA-approved pesticides or require crop diversity?

Mr. LACEFIELD. No, I'm not for any mandate.

Mr. FALLON. And that's what scares me. What would you—what would the primary issue for farmers and ranchers be if mandates like this would go into effect, in your opinion?

Mr. LACEFIELD. It would be—it'd be increased cost of production to—or possibly even feasible to produce.

Mr. FALLON. Well, I want to, again, Mr. Chairman, thank all the witnesses for their testimony. We have to be very careful here, tread very lightly. I represent a majority rural district, a lot of agriculture and a lot of livestock and ranching, and I know these folks work literally harder than any other American, and it's a—sometimes it's a very thankless job.

I think one of the things the pandemic did was really open our eyes to realizing just how essential and critical our farmers and ranchers are. They are literally the backbone of the country. That's where everything begins and everything ends.

Thank you very much, Mr. Chair. I yield back.

Mr. KHANNA. Thank you.

I now want to recognize Representative Flood. Welcome to Congress. Welcome to the committee.

Mr. FLOOD. Thank you, Mr. Chair. I appreciate the opportunity.

You know, in the 1930's, Nebraska dairy farmers had over 800,000 dairy cattle producing 4 million pounds of milk. Today we have 60,000 cows in Nebraska producing the exact same amount of milk. Dairy producers have become more efficient and sustainable over the last 90 years and have significantly decreased their impact on the environment.

Representative Comer's comments about innovation, I think, were very important, that we point out that the producers are actually leading the way on the issue of sustainability.

Mr. Lacefield, were you present online when a prior witness named Ms. Haugen testified that she had 160 dairy cows on her Canton, Minnesota, farm?

Mr. LACEFIELD. Yes, sir, I've been here the whole time.

Mr. FLOOD. So you're familiar with her testimony. Can you tell me how many farmers make a living in the state of Kentucky with 160 dairy cows?

Mr. LACEFIELD. We only have, I think, 380 dairy farms total in the state, and about half of those would be part of our Amish and Mennonite community that would probably have 35 to 40 head dairy, and they have multiple enterprises as well on—with the dairy.

Mr. FLOOD. So obviously there are differences. You know, in our state most of our dairy farms are 800—you know, 500 to 800 head facilities for the most part.

Talk about what innovation has done in agriculture, specifically how we've mechanized a lot of the different processes. I've seen in Nebraska how dairy farmers have automated the entire process of milking cows. Talk about innovation and sustainability as they go hand in hand in the state of Kentucky.

Mr. LACEFIELD. Well, it's the evolution of the industry. We are constantly forced to do more with less, and as we continue to get more regulations, that puts an additional cost burden on to the smaller farmer. It—I'll tie it to banking. That's my other world. I've been in banking and agriculture my whole career. When we went

through the banking changes in the late—early—I guess, 1908, 1909, 1910 Dodd-Frank era, we saw regulation increase that really put undue burden on the small producers—the small banks that, you know, had to have dedicated staff for the regulatory issue. So it forced growth to be able to be competing in the market. The same as with our agriculture, that if we're not advancing with technology, we're unsustainable and unable to be there, unless you do continue to count on external income, all farm income to subsidize the lifestyle.

Mr. FLOOD. Mr. Lacefield, have you seen inflation impact the farming economy?

Mr. LACEFIELD. Significantly, from inputs. We talked earlier about the fuel and how that drives so many of the input costs within in the producer's enterprise budget as well as labor. Everything in a producer's enterprise budget is tied to inflation.

Mr. FLOOD. And how is that affecting the producer's bottom line?

Mr. LACEFIELD. Significantly. It's going to cut into that, and ultimately this cost will be passed on to the consumer.

Mr. FLOOD. Have you noticed that ag policies under President Biden have changed?

Mr. LACEFIELD. Yes.

Mr. FLOOD. How so?

Mr. LACEFIELD. We have seen a rollback from—of course, from which administration? You know, the previous administration, we were navigating global trade wars and a pandemic, and now we're looking at that. But the signals have been that it's going to look more toward small producer and less tied to production agriculture, and as we're discussing today looking at specific practices.

Mr. FLOOD. Have you seen the supply chain crisis threaten American farmers, those in Kentucky especially?

Mr. LACEFIELD. Significantly. Again, the agency I work with, we were able to launch a program during the early 2000—or 2020, right about the pandemic. Folks walked into a grocery store and saw empty shelves for the first time realizing what the slightest disruption will do. We increased the slaughter capacity in Kentucky with a lot of the smaller beef and pork and chicken processors, bringing some up to USDA giving farmers an opportunity to where they can direct retail their meat to consumers.

Mr. FLOOD. Thank you, Mr. Lacefield. I yield back.

Mr. KHANNA. Thank you.

I now want to recognize Representative Ocasio-Cortez.

Ms. Ocasio-Cortez. Thank you so much, Chairman.

And thank you to all of our witnesses here today for sharing your—your testimony.

You know, I think for a lot of folks the term "regenerative agriculture" is something that is completely new to them, and I think it's important that we take a step back and really frame this for everyday people and why this conversation is so important.

So let's start with basic food production 101. We grow, particularly when it comes to growing crops from our soil. Soil is an essential requirement to that. And, Dr. Schattman, I want to make sure that we understand what is happening to the soil in the United States and frankly across the world such that regeneration, this

idea of regeneration is necessary? What is happening to the current U.S. soil supply, we shall say, we shall call it?

Ms. SCHATTMAN. Thank you. It's a great—it's a great question. I think one of the main concerns with soil resources as an essentially nonrenewable resource is that it is eroding and exiting areas where production happens and entering public waterways, taking with it some unused fertility nutrients, either manures or synthetic and pesticides, and that this is having a negative ecological impact.

Ms. Ocasio-Cortez. So we're seeing with our, in the U.S. soil supply that we rely on to grow our crops and to serve as part of our food supply, decarbonization, erosion, decertification, and chemical pollution, which, as you noted, is resulting as well in reduced minerals and nutrients that which can be drawn and put into our food supply, correct?

Ms. SCHATTMAN. That is correct. Although it is important to remember that not all areas are equally vulnerable to soil erosion at the scale that I think you are—you are pointing to. We're mostly concerned about areas where rainfall is expected to become much more variable and more intense, and we're concerned about farming systems that leave soil exposed, such as cropping systems with a lot of tillage or a lot of mechanical cultivation and in arid regions—regions as well.

Ms. Ocasio-Cortez. So what does this mean about how long we have before we, the United States, literally does not have enough arable topsoil to continue feeding the population that it's feeding now? What is the timeline that we have on—on how much topsoil we have left?

Ms. SCHATTMAN. So there was a widely publicized report that came from a scientist at the U.N. FAO that said we have approximately 60 years left in crop-producing regions. However, I've personally looked into trying to track down the data that supports that report, and I haven't been successful in finding it.

Ms. Ocasio-Cortez. Ms. Boyd, indigenous farmers have taken a regenerative agriculture approach to their relationship with the land for millennia, correct?

Ms. BOYD. Correct.

Ms. Ocasio-Cortez. And let's go through some of these practices so that I think folks get a better handle on how we can help preserve the supply. They include tactics like rotating and diversifying crops, correct?

Ms. BOYD. Yes.

Ms. Ocasio-Cortez. Integrating livestock and forestry on farms?

Ms. BOYD. Yes.

Ms. Ocasio-Cortez. And that also reduces the need for tilling and pesticide use, as Dr. Schattman had just previously noted, correct?

Ms. BOYD. Correct.

Ms. Ocasio-Cortez. And, Dr. Schattman, the Department of Agriculture itself has recognized more than 170 other farming practices to be regenerative as well. Is that correct?

Ms. SCHATTMAN. I don't know that they are calling them regenerative, but there is a lot of overlap between regenerative and conservation practices, that is correct.

Ms. Ocasio-Cortez. And we're seeing now that even when you look at 50 or 60 years down the line, Dr. Schattman, just in 2019,

farmers—U.S. farmers were unable to plant crops in 19.4 million acres of land due to record-breaking rainfall, correct?

Ms. SCHATTMAN. That is correct, yes.

Ms. Ocasio-Cortez. And, as recently as this year, small and co-op farmers in the Midwest have had to pivot their lands from corn crops to others such as sunflowers and soybeans because of that record rain, correct?

Ms. SCHATTMAN. Because of rainfall in this year not in 2019, but, yes, that is correct.

Ms. Ocasio-Cortez. And, finally, Mr. Doughty, am I right to understand that on top of contributing to improved water and air quality, soil health and ecosystem restoration, regenerative practices are also more productive ways to farm?

Mr. DOUGHTY. Yes, I believe so. I'm a 100 percent no-till farmer. My father was an early adapter in the 1970's, and I've continued that tradition and improved upon it. We also use waterways, crop rotations, field borders, terraces, ponds, and our land continues to be—to increase in production.

Ms. Ocasio-Cortez. Wonderful. Thank you very much.

Mr. KHANNA. Thank you.

Representative HERRELL.

Ms. HERRELL. Thank you, Mr. Chair.

And thank you for—for all the witnesses for being here, your testimony.

I want to ask Mr. Lacefield, just kind of talking about what has been said in this hearing so far, we know the inflation crisis facing our country is having a devastating impact on our ag industry. And input costs for ag producers like feed, fertilizer, fuel, have exponentially increased in the last year, which is having direct impacts on how many producers and especially those in New Mexico are operating. And, unfortunately, these increased costs are inevitably being passed onto every consumer.

So, Mr. Lacefield, I would want to ask you, what do you think Congress should be doing to address the rapidly increasing cost of agricultural inputs?

Mr. LACEFIELD. Well, I wish there was a simple answer to what we can do. I'm very concerned about what we will have to do to navigate out of this. We've lived through this before, and fighting inflation is very difficult. We watched that in the 1970's and the 1980's, and it's a lot like treating cancer with the chemo to where you almost will have to kill the economy to fix it. It's going to take increased interest rates and reduced spending. We're going to have to bring dollars out of the economy.

Ms. HERRELL. Right. And I really just want to, I mean, thank the farmers, all of them. I mean, this is, you know, two—up to two percent of the population feeding 100 percent of the world really, and it is not easy, and there are so many complexities to it.

And I appreciate, Mr. Chairman, this hearing. But I've got to say that, because this is so important, because I think we all can agree that we like to eat, and there's no doubt about it, there's not going to be a diminishing of that kind of need in our Nation, but I think I also would be remiss if I didn't put on record the frustration the producers in my state especially are feeling toward the Federal

Government, specifically the unnecessary bureaucratic red tape coming from this administration.

From rolling back needed reforms to NEPA and ESA, to bringing back the Obama-era WOTUS rule, this administration has taken many destructive actions that will negatively impact our ag operations. In ESA alone, I have constituents who are losing cattle every day due to depredations caused by endangered wolves or having their herd sizes reduced due tooth endangered New Mexico meadow jumping mouse, or having a timber industry completely taken off the shelf because of the Mexican spotted owl. And pretty soon I fear the only thing that will be endangered in America is the American farmer and rancher.

Thank you, Mr. Chairman, and I hope that we can find some way to work together, because I fear that we are going to have scarcity and shortages in food supply in the next number of months and years if we are not thinking about how we can better bring lower energy cost to the table and help our producers, both with cattle and with produce through this time of crises as we're talking about the inflation, et cetera. So thank you so much for having this hearing.

Mr. KHANNA. Thank you.

Ms. HERRELL. I yield back.

Mr. KHANNA. Representative Tlaib.

Ms. TLAIB. Thank you so much, Chairman Khanna, for this important hearing. I do—would like to take a moment by submitting three items for the record, Mr. Chair, a report from the folks at Food & Water Watch called "Well-Fed: A Roadmap to a Sustainable Food System That Works for All" and petitions from advocates to the EPA focused on air and water pollution from factory farms.

Mr. KHANNA. Without objection.

Ms. TLAIB. There are a few industries, as we all know, that are essential to our survival as—and as uniquely at risk from impacts of climate change as our agricultural sector. At the same time, massive consolidation into huge corporate industrial agriculture has forced many of our small-and medium-size farmers to go out of business.

According to the Open Markets Institute, Mr. Chair, the industrial consolidation of ag has actually cost 17,000 cattle farmers in our country to go out of business every year since 1980. They have been replaced by massive industrial operations focused on short-term profits and ignore long-term environmental impacts, putting our climate and our food supply at risk.

While family farms struggle, big ag thrives, as we continue to see. The biggest four meat packers made a record, Mr. Chair, of $13 billion in profit in 2021. JBS, a Brazilian company and the largest meat packing company in the world, announced that in 2021, and during a pandemic, they earned over $4 billion.

So let's take a peek at their business practices for a moment. Over the past 25 years, JBS gave over $100 million—I would say very much in bribes—to more than 1,800 politicians in Brazil, where the company is based. The company then turned around and used those politicians to secure financing from Brazil's state-owned bank in an effort to consolidate the American beef market.

So, Mr. Doughty, you mentioned in your testimony that JBS attempted to build 10,500 hog factory farms last year near your farm. Can you tell us a little bit more about your experiences with this company, JBS, and please, you know, why did you, you know, decide to fight this project?

Mr. DOUGHTY. Well, this was not JBS. This—they—the operation would have been contracting with JBS. They would have been growing JBS feeder pigs. We—we—we fought that project for three things: First was the neighborhood, the potential air and water pollution, the noise, the flies; and second, the deterioration of our state highways. They are—they're asphalt highways. There—there's no shoulders. They're already crumbling. This particular CAFO would go back among—back in a neighborhood with several—several houses, many families, about seven miles, and we were concerned about what we were going to do about our roads.

And then, third, was a—was our Huzzah conservation area, a 6,000-acre conservation area that's one of over 1,000 public lands, 1,000 conservation areas in Missouri, along with our 58 state parks and 13 national parks. And it is a destination for not only hunting and fishing but hiking and biking and nature watching and kayaking, and it is funded by public dollars. And we were concerned not only about that CAFO, but we were being threatened with a proliferation if this CAFO came in.

Ms. TLAIB. Yes.

Mr. DOUGHTY. And so that's why we resisted.

Ms. TLAIB. No, and you should.

And, Ms. Haugen, can you explain why a small family, you know—our small family farmers are unable to compete? I mean, you know, you don't get a chance to talk to the American people. They don't—you know, the food gets to the table, they have no idea what's actually happening and especially to our small and family businesses—or farmers in particular. So can you talk a little bit about your experience competing with these, you know, corporate agribusinesses?

Ms. HAUGEN. Yes, they are like David and Goliath. I hear some people say, we don't want to have as many regulations. Let's have free market. That would be OK if it were a fair playing field. It does not stay a fair playing field when we have these mega corporate farms. We need something to help keep them in control so we have a fair chance at being what we want to do and doing what we want to do and doing what we can do. We don't like the paperwork and extra regulation, but it's necessary to keep it fair so we have a fair chance.

Ms. TLAIB. No, I think—I really do appreciate you saying that. And sometimes those regulations impact you more than the ones that are supposed to be the ones being checked.

Ms. HAUGEN. Yes.

Ms. TLAIB. It's unfortunate.

But, yes, I appreciate this hearing, Mr. Chair, and I yield.

Mr. KHANNA. Thank you. Thank you very much. It's been a terrific discussion. I want to thank our panelists for their remarks.

I want to thank our staff, Kevin Fox, Katie Thomas, and Aria, for their work, particularly Kevin.

I want to commend my colleagues for participating in this important conversation.

With that, without objection, all members will have five legislative days within which to submit additional written questions for the witnesses to the chair, which will be forwarded to the witnesses for their response. I ask our witnesses to please respond as promptly as you are able.

This hearing is now adjourned.

[Whereupon, at 3:35 p.m., the subcommittee was adjourned.]