



UNITED TO GROW FAMILY AGRICULTURE

**TESTIMONY OF CLAY POPE
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Chairwoman Stabenow, Ranking Member Boozman, and members of the Committee,

Thank you for the invitation to speak about the challenges and opportunities climate change is creating for U.S. agriculture and how we can work to both adapt to the extreme weather events it is exacerbating while also mitigating some of its root causes.

My name is Clay Pope. I am a sixth-generation farmer and rancher from Loyal, Oklahoma. Along with my brother, Steve, my mom, Jacque, and our families, we raise winter wheat and cattle on approximately 2,200 acres in western Oklahoma. In addition to farming and ranching, I have served as a congressional aide, as a member of the Oklahoma State Legislature, and as the executive director of the Oklahoma Association of Conservation Districts—experiences that have given me a unique perspective on the challenges and opportunities that I see in climate policy for agriculture. I am also a member of Oklahoma Farmers Union and am testifying today on behalf of National Farmers Union (NFU).

For more than a century, my family has lived and worked on the same land. For most of that time our production cycle remained the same: after wheat harvest, we would use conventional tillage to control weeds and prepare the ground for planting. Once our wheat was planted in the fall and we had a good stand, we would graze cattle until just before the wheat emerged from dormancy in early March. Once the wheat matured in late May or early June, we would harvest the crop and start the cycle over again.

Then, in 2004, things changed. Facing worn out equipment, concerns about soil erosion, and rising input costs, we worked with our local U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) staff to get technical assistance and financial help from an Environmental Quality Incentive Program (EQIP) contract to convert our operation from conventional tillage to no-till. A few years later—and with lots more help from NRCS, the local conservation district, and others—we began incorporating cover crops into our operation and enrolled land in the Conservation Stewardship Program (CSP). We have never looked back.

Today, we still grow winter wheat and graze cattle on wheat pasture. Now, however, we raise our crops and livestock with an eye toward improving the health of the soil. Instead of tilling our cropland after harvest, we leave the ground undisturbed. Instead of burning diesel all summer by working the ground to control weeds, we follow our winter wheat with a multi-species cover crop that we graze cattle on for 30 to 60 days to both help with nutrient cycling and our bottom line. When we terminate these cover crops, we plant our next wheat crop directly into the residue. We work to minimize soil disturbance, maintain residue cover on the soil, keep something growing on the land as much as possible, and incorporate livestock into the system—all practices that help promote soil health.

This approach to farming is relatively new in our area. Until recently, we did not understand how intense tillage and bare, exposed soil could have unintended detrimental effects on the health of the soil and with it the health of the sub-soil microbial community. It is this community of bugs, bacteria and fungi

that help maintain soil structure, increase the ability of the soil to hold moisture, and help make nutrients more readily available for growing plants.¹

Improving the health of the soil also encourages the terrestrial sequestration of atmospheric carbon. We all learned in junior high school biology that plants breathe out oxygen and breathe in carbon dioxide through photosynthesis. That carbon dioxide, once used by the plants, is largely deposited in the soil as organic matter. When soil is disturbed, it releases that carbon back into the atmosphere. On the other hand, if we minimize soil disturbance and work to increase organic matter, agricultural lands can become a carbon sink.

The benefits of building soil health do not end here. Healthier soils better absorb and hold on to moisture, curbing flooding from extreme precipitation events and storing that water in the form of sub-soil moisture to help when the weather turns dry. As the soil holds on to more water, less runs off into nearby streams and rivers. This not only helps to control erosion, but it also reduces the amount of soil and nutrients that flow off the land, reducing nonpoint source pollution that can threaten drinking water supplies. These same practices also help reduce wind erosion, insulate the soil in the winter, and reduce soil surface temperature in the heat of summer.

Improving soil health can also directly help a farmer's bottom line in the form of reduced fuel use and other inputs. For example, in Oklahoma, winter wheat grown with no-till practices requires about three gallons of diesel fuel less per acre than the same crop grown in a conventional tillage system—resulting in fewer emissions from the farm and less money out of a producer's pocket.² That adds up.

I cannot scientifically quantify all the benefits to my land from our investment in soil health, nor can I absolutely attribute changes in our yields or input costs directly to these practices—certainly, these are areas that would benefit from further unbiased study. What I can tell you is that for the last four years we have had some of our best wheat crops ever while using roughly half of the fertilizer we did when we conventionally tilled our land. We also see benefits from additional grazing (and occasionally baling hay) from the cover crops we plant after our winter wheat.

Further, soil health practices have helped adapt our operation to the extreme weather events that are being exacerbated by climate change. Oklahoma has always had wild weather. Will Rogers once quipped that “If you don't like Oklahoma's weather, wait a minute.” Whether it is droughts, floods, extreme cold, punishing heat, hail, tornados, or blizzards, Oklahoma has it all—sometimes, it seems, all at once.

But now climate and weather experts warn that climate change will give this wild weather volatility a shot full of steroids—and we are already seeing those changes. From 2010 to 2015, Oklahoma suffered a drought that rivaled the one that led to the Dust Bowl. That drought was broken in May 2015 when Oklahoma was hit with the wettest month in the state's recorded history. Over the last few years, we have experienced increased ice storms, changes in rainfall patterns, milder overall winters, record wildfires and, most recently, a historic cold snap that broke all previous records. Something is going on.

¹ Beneficial microbes also play a key role in the transfer of water through the soil structure and sequestering carbon.

² Oklahoma State Extension Service, “No-till Cropping systems in Oklahoma, E-996, Oct. 8, 2012.

By building the health of our soil we are protecting the land and hardening our farm and ranch to the extreme events that seem more and more to be the norm. When it rains on our farm, more of the water is absorbed by the land and made available for crops while more of the soil stays in place. When it turns hot and dry, the ground cover helps reduce soil temperature and water evaporation, better sustaining our crops. This same cover also helps hold the soil in place when the wind, as it so often does in Oklahoma, comes sweepin' down the plains.

The bottom line is that our investment in soil health has helped us better prepare our farm for climate change in a way that has helped both our productivity and the environment. It has worked for us and I believe it can for other farmers and ranchers as well.

Water quality and other benefits of soil health practices; Oklahoma's experience

As we work to address climate change, we should remember that so many of the environmental issues we are dealing with as a nation are interlinked. An example of this is climate change and water quality. By incentivizing soil health, we not only mitigate and adapt to climate change, but also work to protect our nations water. The experience of my own state of Oklahoma is a great example of the multiple public benefits that can be generated by the adoption of soil health practices.

For nearly three decades, Oklahoma has been incentivizing farmers and ranchers to undertake soil health practices in priority watersheds to help address water quality—an effort that to date has resulted in the removal of nearly 90 streams from the U.S. Environmental Protection Agency's (EPA) 303(d) impaired streams list, the most of any state in the nation.

Since in the early 1990s, the Oklahoma Conservation Commission has provided cost-share dollars and funds from the EPA's Clean Water Act Section 319 program to incentivize the adoption of these practices across certain watersheds. Throughout this time technical assistance and additional resources from NRCS and USDA's Farm Service Agency (FSA) have been used help farmers and ranchers through voluntary, incentive-based, locally led efforts in targeted regions. EQIP and CSP have provided additional flexible assistance to farmers and ranchers, while FSA's Conservation Reserve Enhancement Program (CREP) has been used to encourage riparian restoration projects.

This success story shows what can happen when states and the federal government work with farmers and local conservation officials to fund and implement voluntary conservation practices to address resource concerns. By working with local and federal actors, the State of Oklahoma has established a non-point source pollution reduction record that is second to none. This is a model that Congress, USDA, and EPA should look to for tackling climate change and other natural resource issues through improved soil health management across agriculture.

Experience, opportunities, and challenges for carbon markets

Climate change presents a host of challenges for America's family farmers and ranchers, but there are also many opportunities. Among these opportunities is the ability for farmers and ranchers to sell credits from the sequestration of carbon on their land to companies, governments, and emitting entities. Certainly, carbon markets are currently getting a lot of attention as a way to tackle climate change and boost farmers' bottom lines, and they present a lot of potential. As we look to develop

carbon markets, however, we would do well to remember the lessons from past efforts to help ensure that these markets achieve their goals and work for farmers and ranchers.

Again, my home state has a great example. In 2001, the State of Oklahoma passed the Oklahoma Carbon Sequestration Enhancement Act, which, when amended in 2002, established a carbon credit verification program at the Oklahoma Conservation Commission. The Conservation Commission was tasked under the law to serve as the state's referee on carbon credits. Under this system, farmers and ranchers would apply soil health and other carbon sequestering practices to their land while local conservation districts, with training from NRCS, would verify their activities. The number of credits that were generated were determined on modeled sequestration rates used by the Chicago Climate Exchange, a nation-wide voluntary carbon market, and were tracked by the Conservation Commission. The system was practice based: a farmer applied the soil health and other practices that had been predetermined to have sequestration potential and received a credit for that work. Verification costs were paid by the credit purchaser. Training for conservation district staff and their time was offset by an NRCS Conservation Innovation Grant (CIG). Every contract was verified every year and was done with no cost to the participating farmer.

At its peak, the Oklahoma Carbon Sequestration Program had more than 50 thousand acres enrolled across the state—it was generally popular with producers. Many of these acres were also enrolled in state water quality projects, with carbon payments acting as an additional incentive.

The legacy of the Oklahoma Carbon Sequestration Project continues today. While interest in purchasing carbon credits waned after the defeat of the federal cap-and-trade bill in 2009, the soil health and regenerative agriculture practices established in Oklahoma under this program have remained largely intact and continue to provide benefits for the public. As an example, soil health practices implemented as part of this initiative in the watershed of the North Canadian River, which serves as Oklahoma City's primary water supply, are credited with generating water quality improvements sufficient to remove a 760-mile tract of the river's watershed from the EPA's impaired list. A subsequent report by the USDA Southern Plains Climate Hub in 2018 utilizing the NRCS COMET PLANNER tool showed that these same soil health practices are sequestering an estimated 23,312 tons of carbon dioxide equivalent annually³—the same as taking 4,960 cars off the road each year.⁴

Clearly, we can get a lot of public good out of state and federal efforts to encourage farmers and ranchers to apply soil health practices to their land.

Another example of a carbon market to draw from is the aggregation program NFU and North Dakota Farmers Union developed and ran for farmers and ranchers in the mid-to-late 2000s, which also sold on the Chicago Climate Exchange. The National Farmers Union Carbon Credit Program worked to protect

³ Phillips, S., & Pope, C. (2018). Conservation Practices as Tools to Address Water Quality And Climate Change in the North Canadian River Watershed (Rep.). Available at <https://www.climatehubs.usda.gov/sites/default/files/Bundled%20Benefits%20from%20the%20North%20Canadian%20River%202018.pdf>

⁴ This amount is calculated from the average typical passenger vehicle emissions rates outlined by the EPA Office of Transportation and Air Quality in their fact sheet EPA-420-F-14-040a.

the interest of farmers in the market and sold credits that were earned on a per-acre basis through the implementation of no-till and reduced-till cropping, long-term grass seeding, intensive rangeland management, and afforestation. Farmers engaged in the program for both environmental and economic reasons—certainly not all participants necessarily believed in climate change, but they took the opportunity to invest in their land and develop another revenue stream. By 2010, NDFU was the largest aggregator of agricultural soil credits in the United States and distributed more than \$7.4 million to 3,900 farmers across five million acres. All told, these farms and ranches sequestered about 7.6 million tons of carbon over that timeframe.

The role of biofuels in agriculture and climate change solutions

Biofuels production represents another market-based opportunity for farmers that can help to address climate change by providing a sustainable, low-carbon liquid fuel. Farmers are the backbone of the renewable fuels industry in the United States. In addition to supporting the corn ethanol industry, farmers contribute to ensuring that the advanced biofuel volumes can be met.

Facing significant hurdles from expanding urban areas and loss of agricultural lands, farmers nonetheless have increased yields, protected the environment, and moved America toward energy independence. Unlike fossil fuel production, farmers have done this in a sustainable way. The expansion of climate policies like the Renewable Fuel Standard (RFS) has only supported these efforts, allowing farmers to continue to innovate and find new ways to bring added value to their farmland and operation.

EPA has long recognized the contributions increasing biofuels production make to this country's energy independence.⁵ It has been estimated that, over ten years, the RFS has displaced nearly 1.9 billion barrels of foreign oil.⁶

NFU supports efforts to decarbonize the transportation system and feels ethanol is the most immediate way to achieve carbon reductions. A recent Harvard University study found that greenhouse gas emissions from corn ethanol are 46 percent lower than those from gasoline—a decrease in emissions from the estimated 39 percent done by previous modeling.⁷ NFU has long supported a move to higher blends of ethanol because of the clean air benefits.

We encourage the continued stability of the RFS and other biofuels policies. Biofuels create a price-stabilizing mechanism, encourage much-needed reinvestment in our rural communities, help address environmental problems, and contribute significantly to net farm income.

Actions for Congress and USDA to address climate change

I truly believe that agriculture can play a vital role in helping the nation adapt to climate change while mitigating some of its root causes, and we have a once-in-a-lifetime opportunity right now to craft the

⁵ See, e.g., 75 Fed. Reg. 14,670, 14,839 (Mar. 29, 2010); 77 Fed. Reg. 59,458, 59,470-59,471 (Sept. 27, 2012); 81 Fed. Reg. 89,746, 89,763 (Dec. 12, 2016).

⁶ Biotechnology Industry Organization (BIO), *The Renewable: Fuel Standard: A Decade's Worth of Carbon Reductions*, at 1 (2015), available at <https://www.bio.org/sites/default/files/RFS%2010%20Year%20GHG%20Reductions.pdf>.

⁷ RFA, *Carbon Intensity of Corn Ethanol in the United States: state of the science*, <https://iopscience.iop.org/article/10.1088/1748-9326/abde08/pdf>

policy that will achieve this end. Investing in soil health can help farmers and ranchers sequester carbon while improving water quality and quantity. It can help curb the effects of drought and protect the soil that is vital in producing our food, fuel, and fiber. If we learn from these past experiences and get it right, we can generate a paradigm shift in agriculture—a “Brown Revolution”—that will strengthen producers’ bottom lines and provide major public goods through reduced greenhouse gas emissions, cleaner water, and a more stable and abundant food supply.

To sum it up, the secret really is in the soil and cows really can save the planet.

Certainly, I am not alone in this belief. NFU and its almost 200,000 family farmer and rancher members have long called for federal activities that help those working the land lead in developing solutions to climate change that help to reduce carbon emissions and adapt the landscape. At our annual convention last week, members called for urgent action from the federal government to address this crisis.⁸

NFU supports a comprehensive federal approach to climate change that facilitates the leadership of family farmers and ranchers as they make the best decisions for their land and operations and work to implement practices to improve soil health, adapt to changing weather and pest pressures, sequester carbon, and reduce emissions.⁹ Federal climate policy must build on the U.S. Department of Agriculture’s (USDA) voluntary, incentive-based conservation programs that allow for producer choice and flexibility; spur on-farm production of energy and expand the use and availability of biofuels; and encourage markets that appropriately compensate farmers and ranchers for the goods and environmental services they provide.

It is through a combination of these activities, and a commitment by the government to ensure that tools are available to farmers of all sizes, production types, socioeconomic groups, and backgrounds to make the right decisions for their land and operations, that family farmers and ranchers can lead the way in addressing the climate crisis.

To be sure, we already have several tools at our disposal to accomplish this. The most important piece of federal climate legislation to date is the 2018 Farm Bill and its Conservation Title. However, the programs authorized by this act should be improved to reflect the scope of this challenge.

Congress must work with USDA and agricultural producers to emphasize climate adaption in the implementation of EQIP, CSP, the Conservation Reserve Program, CREP, and other conservation programs—and make sure these programs work together and address the needs of those working the land. Additional funds must be provided to assist local NRCS staff with conservation planning and technical assistance and a new focus must be put on how land management practices can help producers better deal with extreme weather. As part of this work, USDA and its Climate Hub network should set a baseline for the impact of current farm bill programs on greenhouse gas emissions and use that data to recognize the good work that has already been done while assessing the potential of

⁸ The NFU Family Farming and Climate Change 2021 Special Order of Business can be found here: https://1yd7z7koz052nb8r33cfxyw5-wpengine.netdna-ssl.com/wp-content/uploads/2021/03/NFU-Special-Order-of-Business-Family-Farming-and-Climate-Change_03022021.pdf

⁹ For details of NFU policy, visit: <https://1yd7z7koz052nb8r33cfxyw5-wpengine.netdna-ssl.com/wp-content/uploads/2020/04/2020-NFU-Policy-Book-03312020.pdf>

existing conservation programs and providing direction for additional activities. Quantifying the good work already taking place will help to defuse much of the hesitancy and anxiety felt by individual farmers and ranchers about climate change efforts, both assuring them that USDA is indeed on their side and enlisting their help in moving forward. Any additional needs or improvements to USDA's conservation programs must be identified and, where appropriate, addressed in the next Farm Bill.

It is also vital to recognize early adopters of soil health and regenerative agriculture practices in any policy efforts. Farmers and ranchers who are already managing soil health are largely unable to participate in carbon markets due to the issue of "additionality"—that idea that only new practices will qualify. However, there are thousands of producers today who have been striving to improve their land, in some cases for decades, developing and testing practices, mentoring others, and laying the groundwork for other farmers and ranchers. I can think of no bigger policy mistake than failing to recognize and provide opportunities for these pioneers.

Meanwhile, Congress and USDA should find appropriate ways to encourage the development of private carbon markets that meaningfully sequester carbon and work to the benefit of family farmers and ranchers. Agricultural producers should have the option, where appropriate, to participate in a private, voluntary market system. USDA should act as an arbiter in these carbon market efforts in a role like that of the Oklahoma Conservation Commission. The department should have the authority to set baselines and minimum standards and establish a public verification system for all ecosystems services credits.¹⁰ Oklahoma found that the more complicated and costly the carbon credit system, the less likely producers are to participate. Markets work best for everyone when the rules are clear. A USDA verification system would ensure producers have an affordable and reliable way to generate tradable credits from their good stewardship practices.

Federal climate policy for agriculture also needs to recognize that due to weather, soil types, and other factors, not all farms will be able to sequester significant amounts of carbon. However, those limitations should not negate a farm's value in addressing climate change. For example, a farmer in semi-arid west Texas who is doing most, if not all, of the practices we know to have a beneficial effect on soil health will control soil erosion, improve water quality, burn less fuel, and conserve water. However, due to weather and soil types, it will take that farmer decades—if not longer—to build measurable organic matter, putting that farm's carbon sequestration rate far below that of producers in other regions. As a result, that Texas farmer will struggle to find a benefit in participating in a carbon market even though they are providing multiple benefits to the American public.

Federal climate programs must be created that also work for that farmer and recognize the multiple benefits that society receives from these improved farming and ranching practices. There are many ways to address this. The government could create or incent an ecosystems services credit marketplace to trade other natural resource benefits in addition to carbon sequestration. Policy makers could also consider an environmental payment program that would fall within the World Trade Organization's "Green Box." For example, CSP could be used to make payments based on an agriculture producer's

¹⁰ Ecosystems services are the multitude of benefits that nature provides to society that can be enhanced through agricultural practices.

level of stewardship. This change would recapture the original spirit of the program: “rewarding the best and incentivizing the rest.”

Finally, USDA must continue to build on its existing research efforts related to climate change and soil health. From drought-tolerant seed varieties to livestock bred to better withstand stress from extreme weather, to improvements in technology, farmers and ranchers need all the tools they can get to better prepare for the challenges production agriculture is facing from climate change. Congress should strive to ensure USDA’s Agriculture Research Service and other public agricultural research entities have the funding and resources necessary to undertake this work.

As part of this research focus, Congress and USDA should build upon the Climate Hubs created during the Obama Administration—we do not need to start from scratch. The Climate Hubs are designed to pull expertise from across USDA and engage with farmers and ranchers. Every agency at USDA has a role to play in helping address climate change and farmers and ranchers will be best served when they work together. The Climate Hubs can be the table where the various pieces of the puzzle from each agency can be brought together to determine the full picture, and what pieces are still missing. Further, as the Hubs are focused on climate change, they can, through outreach and education efforts, help overcome hesitancy across the department and among farmers and ranchers in broaching this subject.

Farmers and ranchers are ready to work with Congress and the Administration to craft these new policies and programs. In fact, we are already doing that. Farmer and rancher organizations, food makers, foresters, and other parts of the agriculture sector have come together as the Food and Agriculture Climate Alliance (FACA) to provide recommendations on how to best position agriculture to address climate change.¹¹ These recommendations, which aim to address many of the issues I have raised today, highlight the need for voluntary and incentive-based programs and market initiatives that are built upon a sound layer of science-based research.

FACA sets a new, higher floor for federal policy discussions around agriculture and climate change, and gives clear, farmer-backed direction to policy makers. I ask that you heed these recommendations and quickly act upon them. America’s family farmers and ranchers are already feeling the effects of climate change on their land—there is no time to waste.

Conclusion

In closing, I would like to reiterate that agriculture is indeed facing numerous challenges resulting from our changing climate. Extreme weather events, increased pest pressure, changes in precipitation patterns, and rising overall temperatures are just the tip of the spear heading our way. But there is a path forward that will work for everyone. The question is: will we do what is needed to take it?

Thank you for allowing me to speak to you today. I would be happy to answer any questions.

¹¹ The recommendations are available at: https://agclimatealliance.com/files/2020/11/faca_recommendations.pdf