



Testimony of
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“Solving the Climate Crisis: Opportunities in Agriculture” Hearing

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Good afternoon Chair Castor, Ranking Member Graves, and members of the House Select Committee on the Climate Crisis. Thank you for the opportunity to appear before you today to share some of my thoughts and experiences involving opportunities for agriculture to contribute solutions to climate change challenges.

My name is Fred Yoder, and I am a 4th generation farmer who has lived and farmed near Plain City, Ohio for over 45 years. Along with my wife Debbie and our 2 children and their families, we grow corn, soybeans, and wheat. We have also operated a retail farm seed business for over 40 years and sell seed to all kinds of farmers including those who use biotech varieties, conventional varieties, and those who grow organic crops. Additionally, we sell precision agriculture equipment to help farmers improve their planting and harvesting operations.

I am testifying today as both a working farmer and as Co-Chair of Solutions from the Land (SfL), a farmer led non-governmental organization that works to place America's farms, ranches and forests at the forefront of resolving food system, energy, environmental and climate challenges and achieving global sustainable development goals. SfL's mission is to identify and facilitate the implementation of integrated policies, practices and projects at a landscape scale that will result in land being sustainably managed to produce food, feed, fiber and energy, while enhancing biodiversity, protecting and improving critical environmental resources and delivering high value solutions to combat climate change.

I want to begin by affirming an important fact. Although the topic we are discussing today can be politically divisive, my personal observations and experiences have taught me there is evidence that the climate is indeed changing. I am a farmer living and working through these climate changes. Climate change is disrupting my operations today and is a major threat multiplier to the future economic viability of my four decade plus family farming operation. As I said in a recent Politico story on this topic, it's absolutely a crying shame that we've politicized climate change. Agriculture is a science-based industry. I make decisions on my farm based on the best science I can find. Science is telling us that the climate is changing. I see it happening before my very eyes. Science isn't perfect, but it's the very best tool we have to make assessments, and the science on this topic is clear.

It's time to stop debating whether or not the climate is changing because of natural or human activities and come together and advance proven, pragmatic and innovative agricultural solutions that benefit producers, the public and the planet. I've devoted much of my life to this cause and that's why I took a day off from my fall harvest to be with you for this very timely and important hearing.

Farmers and ranchers are directly impacted by climate change, and we as an industry are also uniquely positioned to help deliver solutions. Disastrous events due to extreme weather are becoming more frequent, and their cost is enormous. Farmers and ranchers have taken steps to prepare for disasters – but despite their best efforts, the scale of these events has led to widespread crop damage and losses. Weather-related changes make it riskier to raise livestock and produce crops – and require greater resilience. Rising temperatures can reduce the fertility of livestock, reduce their rate of gain, and likewise reduce crop yields. Weather changes have increased the length of the frost-free period (and corresponding growing season), increased precipitation and heavy downpours, and increased frequency of extreme weather events like droughts, floods, fires, and heat waves. These are not things science is telling us will happen. These challenges are happening now and we are struggling mightily to adapt.

In central Ohio where I farm, we have already experienced one of the most difficult growing seasons that I can remember during my farming career. Last year was almost a record wet year, delaying planting by weeks. This was followed by 6 rain events during the growing season of over 2 inches each, and then by a fall that contained virtually no harvest days during the whole month of November. We finally finished field work shortly before Christmas. This year's spring planting was again delayed by weeks because of wet and saturated soils. This was followed by a very dry July and August, greatly restricting plant growth and delaying maturity. As we hopefully finish up harvest this week, yields have been down 20 to 30% from historical numbers. Luckily, this year at least we have so far enjoyed a dry and warm harvest in Ohio, and should finish on time.

Elsewhere, a large swath of the country experienced record winter precipitation in 2019, in some

areas up to 200 percent above normal, leading to major flooding. Spring flooding across the Midwest left many fields unplanted, resulting in about \$2 billion of losses in uninsured stored crops. Cool, wet springs across the Midwest and Ohio River Valley delayed planting, which meant changes in which crops were planted. The Mississippi River rose to historical levels and left acres of fields in Mississippi inaccessible – even for wildlife. Early fall blizzards and early freezes damaged crops in the Dakotas and Upper Midwest. The 2016 California drought was also devastating, resulting in \$247 million loss of farm-gate revenues and up to \$600 million in spillover value lost to the rest of the economy. North Carolina farmers and livestock growers experienced more than \$1.1 billion in losses from Hurricane Florence in 2018. And the list goes on.

Over the past four years, Solutions from the Land has been facilitating and supporting the North America Climate Smart Agriculture Alliance (NACSAA), a coalition of over 70 farm, ranch, forestry, conservation, academic and government partners. These groups have joined together to create a platform for inspiring, educating, and equipping agricultural partners to innovate effective local adaptations that sustain productivity, enhance climate resilience, and contribute to local and global goals for sustainable development. The Alliance is producer-led and focused on utilizing climate-smart agriculture (CSA) strategies to enhance the adaptive capacity of North American agriculture. Adaptive management involves responses taken by producers and the value chain to reduce risks and capture opportunities created by changing conditions. These actions range from minor adjustments in existing production systems to major changes in production and marketing practices.

In considering agricultural solutions to climate change, it's important to recognize and respect the fact that CSA is built upon three complementing and interlocking strategies: 1) sustainably increasing agricultural productivity and livelihoods (i.e. sustainable intensification); 2) enhancing adaptive capacity and improving resilience; and 3) delivering ecosystem services, sequestering carbon, and reducing and/or avoiding greenhouse gas emissions (GHGs). This approach has been embraced and successfully deployed by many stakeholders at the state and national level here in the U.S. and on a global scale through FAO and the Global Alliance for Climate Smart Agriculture, of which SfL is an active member. The reason CSA is an effective

strategy for engendering farmer participation and support is that the approach places farmers at the center of all climate discussions and decisions. It recognizes that the key to engaging and empowering farmers to act is to begin by focusing on economically viable systems and practices that benefit the farmer, improve resilience and simultaneously deliver high value ecosystem services that the public seeks. When I talk to fellow farmers about climate change, I don't talk about what they can do or need to do to save the planet; I talk about innovative practices and systems that help their economic and environmental bottom lines. These same practices also provide solutions to climate change.

Farmers and ranchers take great pride in the practices they use on the farm to protect and enhance the environment. Not every practice will work for every farm. There are 20,000 soil types, 28 growing zones, and 18 major watersheds across the United States. What works in one area may or may not work in another.

That brings me to the second topic I want to cover today – the guiding principles that should be understood and followed as we determine agricultural response strategies to a changing climate. We have given this subject a lot of thought. Working with our NACSAA partners, we've adopted a set of Climate Smart Agriculture guiding principles and are advocating for their use at the global level through our involvement in the United Nations Framework Convention on Climate Change, of which SfL is an observer organization and contributor. Guiding principles are needed to establish a framework for expected behavior and decision-making. I urge the House Select Committee to embrace and follow these guiding principles as you develop your recommended agricultural solution pathways to address the climate crisis:

- As affirmed in the communiqué from the 8th Meeting of G20 Agricultural Chief Scientists (MACS), science-based decision making should be the foundation for the adoption of climate smart technologies and practices for sustainable agriculture and global food productionⁱ.
- Production and production efficiency per unit of land must increase going forward to meet the food needs of the future while incurring no net environmental cost^{ii,iii}.

- As reflected in the Sustainable Development Goals (SDGs) of the United Nations, outcomes (rather than means) applicable to any scale of enterprise must be emphasized, without predetermining technologies, production type or design componentsⁱⁱⁱ.
- Adaptation strategies must be recognized to require system approaches^{iv} that utilize a combination of improved efficiency, substitution (e.g. new crop varieties and breeds), and redesign/system transformation to reflexively respond to continuous short- and long-term changes in climate's impacts on cultivated and natural ecosystem conditions.
- Peer reviewed academic, business and farmer climate smart agriculture research and knowledge sharing recommendations should guide decision-making.
- There is no silver bullet solution for enhancing the resilience of agriculture: solution strategies must embrace a systems approach that recognizes the tremendous diversity of agricultural landscapes and ecosystems and enables producers to utilize the systems and practices that best support their farming operations.
- Farmers must be at the center of all discussions and decision-making; significant input will be needed from a wide range of agricultural stakeholders, including technical agricultural experts drawn from farmer organizations, academia, industry, and international and regional organizations.
- Context-specific priorities and solutions must be aligned with national policies and priorities, be determined based on the social, economic, and environmental conditions at site (including the diversity in type and scale of agricultural activity), and be subject to evaluation of potential synergies, tradeoffs, and net benefits^v.

In SfL's work facilitating farmer-led, multi-stakeholder CSA collaboratives in North Carolina, Ohio, Missouri, Florida and Iowa, we have found general agreement that agriculture is undergoing

transformational change and that climate change is a threat multiplier that requires additional discussion and adaptive management planning. While the types and ways crops and livestock are produced in each state vary, the leaders we have engaged agree that their level of preparedness to adapt to and mitigate the effects of climate change is inadequate. Most forged consensus on the need to conduct comprehensive agricultural vulnerability assessments along the lines of the assessment the state of California just produced. And most agreed on the need to develop and implement comprehensive adaptive management and ecosystem service action plans to enhance the resilience of agriculture and improve the environment.

Federal support to accelerate and scale up work in these areas across the country is needed and could be one of the House Select Committee's primary recommendations to help the agriculture sector deliver climate smart agriculture solutions from the land. Examples of areas of focus for these ecosystem service action plans include:

- Enabling policies which facilitate public and private payments to farmers for the ecosystem services they produce with CSA systems and practices;
- Production systems that improve efficiency and reduce inputs;
- Conservation practices that improve soil organic content, sequester carbon and enhance water storage;
- Reforming crop insurance policies that work at cross purposes with CSA practice adoption, such as those that disincentive the planting of fall cover crops;
- Investments in research and knowledge sharing to give producers confidence to innovate with emerging CSA systems;
- Investments in technology innovation to allow for more widespread adoption of precision agriculture systems such as variable rate fertilizer application technologies;

- Infrastructure investments to allow communities to better manage water challenges from prolonged droughts or intense rain events, ensuring the safe and timely delivery of goods and services necessary to protect the ag economy and national food system; and
- Removal of regulatory barriers which impede the deployment of lower-carbon, high-octane biofuels and new engines that can be optimized to run on these cleaner-burning fuels.

While climate change will pose serious challenges for the agriculture and forestry sectors, it will also present new opportunities in the form of the near-term, high-value, and lower-cost mitigation services these sectors can provide. The potential reductions directly available from these sectors come through three principal mechanisms: carbon dioxide captured by crops, grasses, and trees and sequestered in the soil; emission reductions from improved agricultural management practices; and emissions that are avoided through the production and use of renewable energy and fuels and biobased products.

Fostering the implementation of practices that increase the uptake and storage of carbon into the system will pay dividends for both the climate and food security while delivering multiple ecosystem service co-benefits. For example, increasing soil carbon sequestration for climate increases soil organic matter which can enhance nutrient cycling, water retention and infiltration, support soil biodiversity, and increase crop productivity and climate resilience. These co-benefits are particularly important in Ohio where nutrient leaching from farm fields is contributing to nutrient pollution in Lake Erie.

It is impossible to overstate how important land-based solutions like the ones we have discussed will be to address global climate change going forward into the future. Dr. Rattan Lal, Ohio State University's Nobel Prize-winning expert on soil carbon management and an IPCC report contributor, predicts that properly managed soil, vegetation and animal systems worldwide could achieve 157 parts per million of CO₂ drawdown per year by the next century - nearly 40% of 2018's global atmospheric carbon levels. Enabling policies that address climate change through agriculture and forestry can unlock the huge, untapped potential for America's farms to lead the way towards this goal through both economic and environmental sustainability.

Another important climate solution pathway is offsetting fossil fuel emissions by using biomass to produce renewable energy and biobased products. Because bioenergy emits far fewer GHGs than its petroleum equivalents, broader use can help mitigate climate change. Those benefits were strongly underlined by a USDA study released earlier this year showing that GHGs from corn-based ethanol are about 39 percent lower than from gasoline. The study also states that when ethanol is produced at refineries powered by natural gas, GHGs are even lower, running around 43 percent below gasoline.

The USDA report serves as a reminder of the need for further appropriate policy measures that can optimize the climate benefits offered by bioenergy – an end product of agriculture – to maximize the climate solutions producers can provide from the land. While expanding the opportunity for sales of E15 earlier this year has been a good step, confusion continues to reign over EPA's handling of small-refinery waivers under the Renewable Fuel Standard. The biofuel sector and farmers who grow its feedstocks remain shortchanged under a proposal EPA has deemed to be a resolution of the waiver dispute. It's an issue that must soon be resolved to optimize the contributions our nation's biofuel producers can generate to help stem the ongoing and damaging changes to our climate.

Early action and “big return” steps you could champion to accelerate climate solutions from agriculture include not only improving access to biofuel and other markets for farmers, but also:

- Calling for increased federal funding for conservation tillage, cover crop, and biogas programs administered through the USDA NRCS, Environmental Quality Incentives, Conservation Stewardship and Regional Conservation Partnership Programs;
- Rebuilding the capacity of NRCS, state conservation agencies and local conservation districts to provide much needed technical assistance in writing and implementing CSA plans; providing funding to our nation's land-grant colleges to expand CSA research and extension work;

- Ensuring that rural areas have access to broadband internet service to enable CSA precision agriculture technologies;
- Restoring USDA’s ability to conduct agricultural and economic research in support of CSA; and
- Enabling, through proper funding, USDA’s network of Climate Hubs to develop and deliver science-based, region-specific information and technologies, with USDA agencies and partners, to agricultural and natural resource managers that enable climate-informed decision-making, and to provide access to assistance to implement those decisions.

Thank you for providing farmers with the opportunity to speak on this topic. Agriculture is a high value and near term solution to climate change challenges and farmers need to be directly involved in the climate change policy development process. We hope you will look to Solutions from the Land as a resource as you move forward in exploring the challenges and opportunities that climate change will present to the agricultural and forestry sectors. I would be pleased to respond to any questions.

ⁱ G20 Japan. *8th Meeting of Agricultural Chief Scientists (MACS) Communiqué* [Press Release]. (2019). Retrieved from <http://www.affrc.maff.go.jp/docs/press/attach/pdf/190427-3.pdf>

ⁱⁱ Pretty, J. (2018). Intensification for redesigned and sustainable agricultural systems. *Science*, 362(6417), eaav0294.

ⁱⁱⁱ Campbell, B. M., Thornton, P., Zougmore, R., Van Asten, P., & Lipper, L. (2014). Sustainable intensification: What is its role in climate smart agriculture? *Current Opinion in Environmental Sustainability*, 8, 39-43.

^{iv} Tittone, P. (2014). Ecological intensification of agriculture—sustainable by nature. *Current Opinion in Environmental Sustainability*, 8, 53-61.

^v North American Climate Smart Agriculture Alliance (2015). *A platform for knowledge sharing and application of climate science to agriculture* [Report]. Retrieved from: https://www.sfldialogue.net/files/sfl_formation_plan_2015.pdf