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A 2022 Review of the Farm Bill: The Role of USDA Programs in Addressing Climate Change

Appendix

March 2022

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AGree
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ECONOMIC +
ENVIRONMENTAL
RISK COALITION

The Case for Next Generation Crop Insurance

JUNE 2021

Foreword

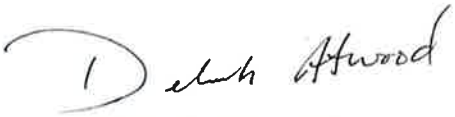
Federal crop insurance is a key risk management strategy for the majority of commodity crop producers. Since 2015, the AGree Economic and Environmental Risk (E2) Coalition has sought to better understand the risk reduction benefits of agricultural conservation practices and how these benefits are accounted for in the Federal Crop Insurance Program (FCIP). This paper summarizes important insights from the Coalition's work on federal crop insurance and conservation.

In sharing what we have learned, AGree hopes to inform current policy debates in a way that drives broader adoption of agricultural conservation practices and strengthens the FCIP by improving understanding of how conservation practices reduce risk and improve farmers' economic outcomes, enhance environmental performance, sequester carbon and support working lands resilience.

Farmers' investments in practices that improve soil health have the potential to increase resilience to severe weather events, reduce environmental impacts, and increase productivity over time. Yet, while conservation practices have the potential to impact both producer profitability and the environment, more work must be done to fully understand how conservation practices reduce risk and how to best reflect those risk-reduction benefits in crop insurance and conservation policy, data innovation efforts and rating models.

AGree's work is intended to support and inform the work of the Risk Management Agency – as well as other USDA agencies such as the Farm Services Administration (FSA) and Natural Resources Conservation Service (NRCS) – to promote climate-smart agriculture through federal crop insurance and other programs.

We hope you find this paper to be a useful resource.



Deborah Atwood

Executive Director, AGree

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Executive Summary

Federal crop insurance, a major component of the federal farm "safety net," is a central component of risk management for the vast majority of commodity crop producers. Since 2015, the AGree Economic and Environmental Risk Coalition (AGree E2 Coalition) has sought to better understand the risk reduction benefits of agricultural conservation practices and how these benefits are accounted for in the federal crop insurance program (FCIP). The AGree E2 Coalition grew from the foundational work of AGree, an initiative designed to elevate food and agriculture as a national priority. We are housed within Meridian Institute, a mission-driven nonprofit consultancy that builds understanding, guides collaboration and drives action to address our world's complex challenges.

This paper summarizes important takeaways to date from the E2 Coalition's work on federal crop insurance and conservation. In sharing what we have learned, AGree hopes to inform current policy debates in a way that drives broader adoption of agricultural conservation practices and strengthens the FCIP by better understanding how conservation practices reduce risk and improve farmers' economic outcomes, enhance environmental performance, sequester carbon, and support working lands resilience.

The agriculture sector is uniquely impacted by weather. Building landscape resilience is vital to protecting agricultural yield and farmers' livelihoods today and into the future. At the same time, agriculture is a significant contributor to greenhouse gas emissions, while having the capacity to serve as a carbon sink.

A growing body of evidence — including work supported by AGree — shows that farmers who use conservation practices, such as cover cropping, conservation tillage, diversified crop rotation, and management-intensive rotational grazing, reduce yield risk, which, in turn, could result in fewer insurance claims. Research shows that conservation practices can improve water quality and soil health by increasing soil organic matter, and, relatedly, healthier soils reduce risk, especially in very dry or wet conditions, as well as sequester carbon.

The Risk Management Agency (RMA), an agency within the United States Department of Agriculture (USDA), implements the FCIP and has begun to look at how conservation practice implementation can reduce risk. AGree's work is intended to support and inform the work the Agency has begun to understand the effects of conservation practice adoption on yield variability, which is a measure of risk used by RMA. This effort will require using robust data analysis to determine the impact of weather, conservation practices, soil type and other variables on yield risk. Further, policy alignment between agencies — including RMA, Farm Services Administration (FSA), and Natural Resources Conservation Service (NRCS) — that serve producers is needed to ensure that program design and implementation work together to facilitate climate-smart agriculture while reducing administrative barriers and challenges for farmers seeking to adopt and expand the use of agricultural conservation practices.

Through our work over the last several years, we have identified the following key areas where policy improvements can support RMA and drive next generation crop insurance for the benefit of farmers, the environment and taxpayers now and into the future.

- **DATA INNOVATION:** Modernize data collection, interoperability, storage and sharing while protecting producer privacy.

- **CROP INSURANCE AND CONSERVATION POLICY:** Improve crop insurance and conservation policies so that they work better for farmers and reduce risk while adopting new policies that encourage adoption of conservation practices that reduce risk.
- **FCIP RATING MODEL:** Enable research that helps strengthen the FCIP risk rating model by addressing knowledge gaps, and utilize data to assess and improve on-the-ground outcomes.

Introduction

Federal crop insurance is a key risk management strategy for the majority of commodity crop producers. The three largest commodity crops — corn, soy and wheat — are overwhelmingly insured under the Federal Crop Insurance Program (FCIP), with over 90% of corn and soy acres and over 85% wheat acres enrolled (Congressional Research Service, 2021). These insured acres equate to an enormous landmass of over 195 million acres (Farm Bureau, 2018). Crop insurance is one of the largest expenditures under the farm bill, representing about 37% of the total farm portion of the farm bill[1] or around $10 billion per year (Congressional Budget Office, 2018).

Every year, farmers have weather-related losses, but in some years, such as in 2012 or 2019, years that saw substantial drought and flooding respectively, the safety net is relied on expansively, with billions paid in insurance claims (Rippey, 2015; Schnepf, 2020). For example, 2019 saw record "prevent plant indemnities" with $4.2 billion paid to farmers who were not able to plant because of very wet conditions (Schnepf, 2020). Given the high enrollment and significant federal subsidization,[2] crop insurance has the potential to drive broader adoption of agricultural conservation practices that reduce risk and provide a host of economic and ecological co-benefits including, for example, sequestering carbon and improving water quality.

Reducing agricultural risk and building landscape resilience are essential as the impact of climate change accelerates (SARE, 2018). As the atmosphere warms, severe weather events are increasing in frequency and climate changes are occurring. The Midwest, where the majority of commodity crops are produced, is generally becoming wetter in the spring, while the summers are becoming drier and hotter, as is much of the Western Plains. The Fourth National Climate Assessment (2018) has summarized climate-related challenges in the Midwest as follows:

> *Increases in warm-season absolute humidity and precipitation have eroded soils, created favorable conditions for pests and pathogens and degraded the quality of stored grain. Projected changes in precipitation, coupled with a rise in extreme temperatures before mid-century, will reduce Midwest agricultural productivity to 1980 levels without major technological advances.*

Mounting scientific evidence shows that conservation practice implementation reduces crop yield risk during times of drought, heavy precipitation and flooding. Additionally, conservation practices provide multiple environmental benefits, including improved water quality and soil moisture management, carbon sequestration, and habitat (U.S. Farmers and Ranchers Alliance Ecosystem Services Science Advisory Council, 2019). These co-benefits may also create new funding streams for farmers as carbon and water quality markets come online.

To help inform work under way by U.S. Department of Agriculture (USDA), as well as, broader policy efforts to improve farm policy, this

[1] The "farm" (or producer-focused) portion of the farm bill excludes the Supplemental Nutrition and Assistance Program.

[2] The average federal premium subsidy between 2008-2017 was 62% (Congressional Research Service, 2018).

paper provides AGree's synthesis on the following issues:

- *The risk-reducing effect of conservation practices;*
- *Barriers to conservation practice adoption by producers in the FCIP; and*
- *Critical need for improved agriculture data collection, utilization and policy alignment among USDA agencies that serve farmers.*

The Risk Management Case for Conservation Practices

A growing body of research shows that conservation practices are an effective risk reduction strategy. As noted above, the 2019 planting spring season was the wettest on record in many areas (USDA, 2019). As a result, farmers submitted over $4 billion in insurance claims for nearly 20 million acres where wet conditions prevented farmers from planting a cash crop within the time required by insurance, a circumstance known as prevent plant or prevented planting (Congressional Research Service, 2020).

A recent National Cover Crop Survey (Survey) found that 78.6% of the respondents reported wet planting conditions that delayed planting, but that 78% of farmers who planted cover crops did not have prevent plant claims (2019-2020 National Cover Crop Survey). In addition, the Survey found promising results for "planting green," the practice of seeding a cash crop directly into a living cover crop and allowing both to grow for a period. Despite saturating spring rains, 54.3% of respondents reported they were able to plant cash crops sooner in green-planted fields than in fields where cover crops were terminated early or were not present (2019-2020 National Cover Crop Survey). Many producers also reported other benefits, with 70.5% respondents reporting that the planting green improved weed control when compared with their other fields (2019-2020 National Cover Crop Survey).

The Conservation and Crop Insurance Research Pilot, a collaboration between AGree, researchers at the University of Illinois, and USDA, will shed further light on the impact of cover crops on risk management during wet years. Under the pilot project, researchers are looking at USDA data and other information for six states—Indiana, Illinois, Iowa, Missouri, Minnesota, and South Dakota—to better understand how the use of cover crops and no-till affected corn and soybean planting dates in the extremely wet spring of 2019, whether planting occurred at all (prevent plant crop insurance claim declared), and what impact the conservation practice(s) had on 2019 yields. Results of this data analysis effort should be available by early 2022.

At the other end of the weather spectrum, soil organic material (SOM), of which soil organic carbon is the main component (Lal, 2016), has been found to protect yields during drought conditions. Higher levels of SOM improves water retention, thereby mitigating against the impact of drought. Further, SOM is important to overall soil health and carbon sequestration, which is key to the growth of terrestrial carbon sequestration markets (reThink Soil: A Roadmap for U.S. Soil Health, The Nature Conservancy, 2016). Cover cropping, no-till, and conservation tillage increase soil organic matter (Chambers et al., 2016; Poeplau and Don, 2015; Yu et al, 2020).

Consistent with the benefits associated with SOM and its relationship with cover cropping

and tillage, a recent U.S. study on maize (corn), concluded that soil organic matter protects yields and lowers crop insurance payouts (Kane et al., 2021). Further, using long term evidence, Bowles et al., found that using *crop rotation diversification* across North America increased maize yield in all weather conditions, including drought (Bowles, 2020). Introducing advanced grazing management systems, such as management intensive grazing, into cropping systems has also been shown to improve soil health and, relatedly, increase soil organic material (Wallace Center, 2018).

Policy Impediments to Conservation Practice Adoption

Although the use of cover crops has increased over the last decade, only a small percentage of cropland acres—about 3.9% of all U.S. cropland—is planted in cover crops (2017 Agriculture Census). While important changes were made in the 2018 Farm Bill related to cover crops and crop insurance eligibility, policy impediments – both actual and perceived – hinder conservation practice adoption by farmers who participate in the FCIP. These challenges persist despite RMA's recent changes to cover cropping guidelines intended to make it easier for producers to adopt the practice. Policy barriers fall into three main categories:

1. *Policies that prevent or make adoption of conservation practices challenging;*
2. *Lack of information regarding the compatibility of conservation practices with FCIP; and*
3. *Lack of incentives to implement conservation practices in the first place.*

For historical context and as an illustrative example, prior to the 2018 Farm Bill, farmers faced the danger that an indemnity claim would be denied if they did not either adhere to USDA guidelines regarding cover crop termination or receive advanced approval for deviations. This policy discouraged many producers from planting cover crops. To address this barrier, the 2018 Farm Bill included language that provided cover crops were to be considered good farming practices (GFP) so that termination deviations would be treated similarly to other farm management decisions.[3] In response, RMA removed the advanced approval requirement, re-issued slightly modified termination "guidelines" to clarify termination options for cover crops, and provided that cover cropping, including termination issues, could also use the good farming practices process if necessary. This shift in policy is important for reducing impediments to adoption. The guidance document, however, requires ongoing refinement and expansion by the Natural Resources Conservation Service (NRCS) so that the termination guidance can be used by innovative farmers without the need to go through the GFP process.

Despite this change, however, over a quarter of farmers in a recent survey expressed the belief that crop insurance is a barrier to cover crops, and 34.7% did not know whether or not crop insurance is a barrier (Fleckenstein et al., 2020).

[3] Section 11107, The Agriculture Improvement Act of 2018 (2018 Farm Bill), P.L. No. 115-334.

This lack of knowledge indicates the need for RMA and NRCS to take an *affirmative and coordinated* outreach and education role to enhance awareness and understanding of the multiple benefits of cover crops.

Moreover, crop insurance coverage concerns continue for other conservation practices that are endorsed by NRCS, but where RMA must determine that implementation does not impact historic yield or maturation. This challenge of FCIP keeping up with conservation innovations that reduce risk is an impediment to broader adoption of conservation practices, as well as improved economic and environmental outcomes for producers. Fortunately, the secretary of the USDA has the authority to address this misalignment by improving the coordination between agriculture agencies in policy development and program delivery, strategies that are also necessary to attain the administration's ambitious climate goals.

The third challenge is the lack of incentives to *adopt* risk-reducing conservation practices. The reasons why farmers choose not to implement conservation practices are multifactorial, but economic concerns are often an important factor in their decision-making (2019-2020 National Cover Crop Survey). To partly address this concern, recently Illinois, Iowa and Indiana partnered with RMA to provide a $5 per acre crop insurance premium discount for eligible farmers enrolled in FCIP who implement cover crops. Farmer demand for this modest incentive out-paced available funding.

Recently, RMA built on the overwhelming success of these state programs through the Pandemic Cover Crop Program (PCCP), a new initiative which offers a $5 per acre premium discount for the 2021 crop year. To be truly effective, any incentive needs to be ongoing and available on an annual basis so that it encourages greater adoption and not only rewards past practice. The incentive should be extended to farmers enrolled in Whole Farm Revenue Protection, so the program is inclusive of diversified operations, including specialty crops. Additional funding for RMA to incorporate cover crop reporting into the Acreage Crop Reporting Streamlining Initiative (ACRSI) would also make cover crop reporting easier in the future. Finally, as the PCCP is implemented, we encourage USDA to capture and publish the results of this incentive to further demonstrate our understanding about the risk-reduction benefits of cover crops and ensure that federal crop insurance policies acknowledge the connection between conservation, soil health and agricultural risk.

RMA's initiative to support cover crops in the current crop year is a positive step, but more must be done to accelerate the adoption of cover crops and other conservation practices. As we discuss further below, despite growing evidence that conservation practices reduce risks, the risk rating model used by RMA may not adequately recognize the risk reduction benefits of soil type, conservation practice adoption and other variables.

Assess the FCIP Rating Model

In order to more accurately and fairly assess risk, research is needed to help assess and, as needed, strengthen the FCIP risk rating model by addressing knowledge gaps and utilizing data to improve on-the-ground outcomes. In particular, the FCIP rating model should evolve — as supported by research — to consider the risk reduction benefits of conservation practices in the context of increased climate risk. Currently, RMA relies primarily on average historical yields (Actual Production History or APH)

and loss costs to determine baseline insurable yield levels and risk rates but does not consider soil health improvements from conservation practice use. In particular, there is a lag between when soil health improvements will affect yield variability and performance in reality versus when they will be reflected in the RMA risk assessment (actuarial data). In the case of APH, it could take years for the soil health improvements to be fully reflected. In the case of rates, since loss experience — the amount of loss an insured farm experiences — of producers using conservation practices are pooled with loss experience in fields not using conservation practices, rates may be biased against conservation practice use relative to conventional practices.

A watershed 2017 study published in the American Journal of Agricultural Economics by Woodard and Verteramo-Chiu explored the feasibility of using soil data when determining crop insurance guarantees and rates. The researchers used high-resolution data sets for soil type, one indicator of soil quality and carbon sequestration potential, and overlaid other data regarding soil health attributes such as available water storage and soil organic carbon. The study found that estimating risk using available soil data sets is feasible. Further, the researchers found statistically and economically significant differences in premium pricing between RMA's risk ratings and the risk ratings calculated when incorporating soil data. In particular, RMA's ratings generally underpriced insurance premiums for low quality fields and overpriced high-quality fields, an artifact of pooling dissimilar risks in RMA's rating.

Other contemporary research confirms the risk reduction benefits of healthy soils. Following Woodard and Verteramo-Chiu (2017), Kane et al. (2021) analyzed county data from 2000 to 2016 related to corn yield, drought and crop insurance claims. The data analysis showed that "counties with higher soil organic matter are associated with greater yields, lower yield losses, and lower rates of crop insurance payouts under drought," corroborating earlier work. Another recent study analyzed long term yield data sets for maize in the United States and Canada and found that diverse crop rotations increased yield *across all growing conditions* by 28% (Bowles et al., 2020). As severe weather becomes more commonplace and temperatures rise, the information from such studies likewise becomes increasingly more important to gather and apply.

Ongoing research will further enhance our understanding about the role of soil health and conservation practices in risk reduction.

In addition to the Conservation and Crop Insurance Research Pilot discussed above, research is underway through RMA's 508(h) process, which provides an avenue for third parties to propose new insurance products that could be beneficial to producers to determine how and in what combination ("stacked") conservation practices reduce risk. These 508(h) projects, if approved by the Federal Crop Insurance Corporation (FCIC) Board, could provide information for new insurance rating methodologies that explicitly consider conservation practices. The Conservation and Crop Insurance Research Pilot is an example of why the ability of third parties, such as companies, NGOs and others, to develop plans of insurance through the 508(h) process must be maintained and protected.

Harness the Power of Agriculture Data

Essential to improving the farm safety net to meet today's challenges is agriculture data.

Agri-business has long understood the value of data in driving improved outcomes on the farm. For years now, companies like John Deere and The Climate Corporation have been collecting and using big data sets to analyze and improve productivity at the field level. USDA has a growing awareness of the need to modernize its approach to data collection and is taking affirmative steps to address multiple data silos, data gaps and a lack of data interoperability in order to improve its program implementation and to support extramural research. Consequently, supporting these efforts across agencies by addressing legal and policy gaps is essential to fully modernize USDA's approach to data collection and utilization.

AGree has been working with diverse stakeholders to help address USDA's data collection and utilization issues. For example, the 2018 Farm Bill included language at section 12618 that required the USDA to assess and report to Congress its current conservation datasets, and the effects of conservation practices on farm and ranch productivity. USDA's report to Congress inventoried major data sets but also described the limited authority to facilitate extramural research into the impacts of conservation practices on productivity.[4]

Since the passage of the 2018 Farm Bill, USDA has made inroads in addressing agriculture data shortcomings, but administrative barriers and legal gaps remain that stand in the way of harnessing the power of modern data analysis to improve programmatic outcomes. The good news is that these issues are solvable. For example, Senators Klobuchar and Thune supported the aforementioned agricultural data language in the 2018 Farm Bill that helped provide the impetus to USDA's current data efforts, including the Crop Insurance and Conservation Practice Research Pilot. Currently, climate and other bills being considered by Congress, as well as a commitment at the USDA to optimize its programs and authorities to provide climate solutions and better serve farmers, provide a rare opportunity to address these administrative and legal issues. Adopting industry standard data infrastructure, security protocols and user permissions to protect security and confidentiality of producer data while automating and standardizing data collection, storage and sharing are key to moving the USDA's programs forward in a way that better serves farmers and accelerates climate smart agriculture.

The Road Ahead

Given the challenges of climate change and other pressures on farmers, there is an urgent need to innovate our approach to the farm safety net.

A convergence of diverse, bipartisan stakeholders around the interrelationship between crop insurance, conservation and climate is providing a unique opening to do so. From these efforts, we have identified three, interrelated components for creating, implementing and continuously improving next generation risk management.

- **DATA INNOVATION:** Modernize data collection, interoperability, storage, and sharing while protecting producer privacy.
- **CROP INSURANCE AND CONSERVATION POLICY:** Improve crop insurance and conservation policy so that they work better for farmers and reduce risk while adopting new policies that encourage adoption of conservation practices that reduce risk.

[4] Report on file with Meridian Institute.

- **FCIP RATING MODEL:** Enable research that helps strengthen the FCIP risk rating model by addressing knowledge gaps, and utilize data to assess and improve on-the-ground outcomes.

By harnessing the power of agricultural data, growing our knowledge about what conservation practices work and where and applying this knowledge to USDA programs, we can improve risk management, generate a host of co-benefits and provide a better value for farmers and taxpayers.

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Climate, Food & Ag **Dialogue**

Recognizing Early Innovators

Recommendations for Maintaining and Expanding Climate-Smart Agricultural Practices

March 2022

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Although all the individuals formally affiliated with CFAD may not agree completely with every statement noted, they are committed to working together to find solutions to the challenges facing food and agriculture. CFAD members participated as individuals, not as official representatives of their organization.

Foreword

The **Climate, Food, and Agriculture Dialogue (CFAD)** is a group of climate, food, and agriculture interests advocating for ambitious and durable federal policy solutions on food systems and climate change. The Dialogue's long-term goal is to enact federal climate policy in line with our guiding principles.

This paper provides insight and recommendations on the challenges facing "early innovators." Early innovators are our leaders in conservation agriculture. They have tested and developed climate-smart practices, demonstrated the benefits, and paved the way for others to follow. Unfortunately, early innovators can be excluded from public and private conservation programs, which target incentives toward farmers who are new to the conservation space.

As public and private investments in climate-smart agriculture increase, we risk excluding the very leaders who blazed the trail for the expansion of climate-smart agriculture. Our goal should be to develop an agricultural system that encourages maintenance of existing climate-smart practices, continued innovation, and broader adoption of climate-smart practices by producers who have not yet been persuaded to adopt them. The recommendations within this paper were developed with that goal in mind.

We hope you find it to be a useful resource.

The AGree Climate, Food, and Agriculture Dialogue (CFAD)

Introduction

Expanding climate-smart agriculture is a central tenet of the Biden Administration's whole-of-government approach to address climate change, stimulate economic growth, and support agricultural productivity.[1]

At the 26th United Nations Climate Change Conference of the Parties (COP 26), President Biden launched the Agriculture Innovation Mission for Climate in partnership with the United Arab Emirates, 31 other countries, and 48 NGOs, to mobilize $8 billion in investments in climate-smart agriculture over the next year.

Pursuant to that goal, U.S. Secretary of Agriculture Tom Vilsack highlighted USDA's Climate-Smart Agriculture and Forestry Partnership Initiative as a key strategy for advancing climate-smart agriculture, saying:

> *"We're positioning U.S. farmers, ranchers, and forest landowners as leaders in addressing climate change, while at the same time creating new market opportunities for them through pilot projects that invest in science, monitoring, and verification to measure the benefits of climate-smart production practices. Unlocking these markets will be key to tapping into the incentives needed to adopt climate-smart practices on the ground."*[2]

As programs are developed by both government and the private sector to address climate change by incentivizing adoption of climate-smart practices, many farmers and policymakers are asking how the contributions of the "early innovators" of these practices will be recognized and rewarded.

Early innovators are our leaders in conservation agriculture – they have tested and developed new climate-smart practices, proved their efficacy and long-term profitability, and paved the way for others to follow. Although early innovators shouldered the risk and, in many cases, the cost of establishing climate-smart agricultural practices, newcomers to climate-smart agriculture are now better positioned to participate in programs looking for new carbon sequestration and emissions reductions ("additionality"). This puts the early innovators at a financial disadvantage to other producers, who have more room for improvement and will be able to stack greater income from ecosystem service payments. Early innovators should not be financially penalized going forward because they chose to take action sooner than others.

There is also concern that the challenge early innovators face in generating additional emissions reductions could create a moral hazard – the financial incentive to revert to conventional management to become eligible for private carbon markets. These concerns beg the question: **How do we create a system that ensures farmers who have transitioned to climate-smart agricultural practices will maintain practices over the long-term, while continuing to improve and innovate?**

The purpose of this paper is to outline a framework for understanding the early innovator issue and share CFAD's consensus recommendations.

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[1] USDA is in the process of developing an official definition of "climate-smart agriculture." In this paper, we use the term to refer to integrated agricultural practices that maintain or increase productivity, enhance resilience, and reduce emissions (avoiding emissions or potentially removing them from the atmosphere) on U.S. working lands.

[2] United States Department of Agriculture. [Press Release 0239.21]. (2021, November). USDA Underscores Commitment to Climate Action at COP26 | USDA

Issue Assessment

Over the fall of 2021, CFAD convened panel discussions composed of private sector, government, and NGO experts to better understand the issue and develop a set of consensus policy recommendations. Based on these discussions, our assessment of the early innovator issue is as follows:

- **There is no single, agreed-upon definition of what makes producers "early innovators,"** which complicates discussions about how their contributions should be considered and recognized. "Early innovators" are generally referred to as producers who have implemented some number of conservation practices, and it is inferred that these practices likely have been in place for a significant amount of time (i.e., longer than just a few years). The reality is that the early innovator community is not a monolith—it includes crop and livestock producers who have implemented climate-smart practices on the entirety of their farm for decades, as well as those who have periodically implemented selected practices on just a portion of their operation for shorter durations. Furthermore, many producers who have adopted one or more conservation practice will still be eligible for carbon market programs if they agree to expand or add new practices. **Policy discussions should recognize that early innovators face varying degrees of difficulty in benefiting from carbon market programs**—including small and medium-sized, diversified, and BIPOC producers—depending on the breadth and duration of their conservation actions, the size of their operations, and geography and soil type.

- **We do not have a comprehensive assessment of how many early innovators exist and consequently do not understand the magnitude of the risk of losing their established conservation progress.** Estimates point to a relatively low number of farmers who would be *entirely* excluded from carbon markets. Data from the National Agricultural Statistics Service's (NASS) 2017 Agricultural Census estimates that conversion to no-tillage systems has slowed in recent years, only expanding from 96.5 million acres to 104.5 million acres between 2012 and 2017. Increase in cover crop acreage has been more significant over that period; however, the total extent of cover crop adoption remained relatively low at only about 15 million acres in 2017.[3] NASS also reports that there are 5.5 million acres in organic production as of 2019.[4] These numbers can be interpreted either as a minor issue in the grand scheme of the climate crisis or as millions of acres of U.S. farmland potentially at risk of losing conservation practices due to perverse incentives.

- **Early innovators are an important group of producers—they represent conservation innovation, leadership, hard work, and risk-taking.** They have created conservation benefits that need to be recognized and maintained. Moreover, agricultural communities look to early innovators before investing in climate-smart and other conservation practices. Seeing unequal compensation for the same practices could alienate conservation leaders and disincentivize the teaching, promotion, and adoption of innovative, new climate-smart agricultural practices. **Our goal should be to develop an agricultural system that encourages maintenance of existing climate-smart practices, continued innovation by conservation leaders, and the adoption of climate-smart practices by producers who have not yet been persuaded to adopt them.**

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[3] National Agricultural Statistics Service. 2017. *Census of Agriculture Vol. 1, Chapter 1: U.S. National Level Data (Table 47: Land Use Practices by Size of Farm: 2012 and 2017)*. Retrieved from st99_1_0047_0047.pdf (usda.gov)

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Recommendations

A range of incentives have been proposed to reward early innovators for past actions, including one-off, lump-sum payments and amending USDA conservation programs to reward conservation maintenance. However, CFAD proposes that the most sustainable and influential way to maintain and expand climate-smart agricultural practices is to build the business case for conservation adoption. This can be done by embedding incentives for the adoption and maintenance of climate-smart agricultural practices throughout agricultural markets, finance systems, regulatory processes, and insurance programs. These strategies will benefit both early innovators and those new to climate-smart agricultural practices.

Our recommendations for creating this system include the following:

1. **The USDA Economic Research Service should conduct a literature review of existing research to understand the economics around producer motivations for implementing and maintaining climate-smart practices.** Research should answer the following questions, which can offer important lessons for current USDA efforts to promote conservation adoption:
    - How many early adopters exist and how many acres of U.S. farmland are currently in conservation practices? How many of them are unlikely to qualify for private carbon market contracts?
    - What are early innovators' motivations for implementing conservation practices and the current business case for practice maintenance? Many early innovators have been supported in their efforts by USDA conservation program funding and technical assistance. Once those programs have run their course, what is the bottom-line benefit to the producers to maintain their efforts?
    - How likely are early innovators to "undo" their current soil health practices to qualify for carbon market payments? Does the promise of a carbon market payment outweigh the soil health and other financial benefits of continued conservation?
    - How many early innovators have already received government payments for implementing climate-smart practices? Potential compensation of early innovators should take into account if they already received some sort of incentive based on other ecosystem benefits – e.g., soil erosion, water quality, habitat, etc.
    - In emerging markets where producers are able to stack payments for product with payments for ecosystem services, what is the extent of the financial disadvantage this creates for early innovators?
    - What has caused the stagnation of climate-smart practice adoption nationally?

2. **The Federal Crop Insurance Program (FCIP) should recognize the risk-reducing benefits of conservation practices.** Expanding the good farming practices accepted by the FCIP to include NRCS-approved "good farming practices" that are proven to reduce risk is one cost-effective approach. Lowering the cost of crop insurance premiums for producers with a record of using climate-smart practices that reduce agricultural risk is another. There is actuarial evidence that certain conservation practices such as cover crops, reduced tillage, and crop rotation are effective risk-reducing strategies that include substantial climate benefits; these benefits should

be recognized through crop insurance premiums.[5] For example, a new crop insurance endorsement for corn farmers called the Post-Application Coverage Endorsement (PACE) provides supplemental coverage for farmers who split-apply nitrogen, a practice that supports the nitrogen needs of corn at specific times in the crop's growth cycle. This endorsement incentivizes the efficient use of fertilizer and promotes cost savings for producers and has important environmental benefits by reducing nitrogen release into water and air. Private-sector opportunities to capture environmental and risk-reducing benefits by paying for insurance products such as PACE should also be explored.

3. **Agricultural lenders should recognize the economic benefits of conservation practice adoption, including improved soil health and reduced agricultural risk, when offering loan terms to producers**. A growing body of evidence is demonstrating that, over the long term, conservation practices can reduce farmer costs and risk, increase asset value of farming operations, increase yield resilience, and diversify farm income streams – producing benefits for both farmers and their financial partners. These benefits should be quantified and incorporated into financial products offered to farmers who adopt climate-smart agricultural practices.[6]

4. **USDA should continue to explore the development of climate-smart commodity markets that reward early innovators through new market mechanisms. Supporting markets that preference agricultural commodities produced using practices that reduce greenhouse gas emissions or sequester carbon would strengthen the business case for climate-smart agriculture.** This is a place where early innovators have a significant head start given their years of experience and can capitalize on their technical expertise. In addition, USDA should use existing authorities to develop infrastructure (e.g., drying technologies, composting systems, seeds stocks, etc.) that supports the implementation of new practices, commodities, and livestock and cropping systems.

5. **Ecosystem markets that allow producers to generate both carbon credits and other ecosystem services credits from the same project should be explored to create stacked incentives to expand and maintain existing conservation practices.** When it comes to ecosystem services, the whole is greater than its parts—stacking payments is a way to recognize the greater value that more intact ecosystems provide. Such markets may allow early innovators to generate income from the full range of ecosystem services they create as well as increase the market incentives for conservation overall by providing multiple income streams. As ecosystem services markets take shape, it is critical they are inclusive of small- and medium-scale, diversified, and BIPOC producers.

6. **Food and beverage companies should consider how early innovators can be included in supply chain sustainability programs** to reduce scope 3 emissions.[7] As companies work to reduce emissions and meet climate commitments, they should ensure early innovators are eligible for any incentives and programs to expand adoption of climate-smart practices.

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[5] The Case for Next Generation Crop Insurance, a white paper published by the AGree Economic and Environmental Risk (E2) Coalition, summarizes important takeaways to date from work done by the E2 Coalition's work on federal crop insurance and conservation.

[6] The Environmental Defense Fund has released numerous studies and reports identifying how farmers and financial partners can quantify the financial benefits of conservation practices and incorporate that value into policies, products, and decision-making. These resources can be found here.

[7] Companies can assess and report their greenhouse gas emissions across three different "scopes" using the Greenhouse Gas Protocol. Scope 1 refers to greenhouse gas emissions from an organization's directly owned and controlled resources. Scope 2 refers to indirect emissions from the energy an organization purchases from a utility provider. Scope 3 includes indirect emissions from a company's supply chain—for example, the production of wheat or the transport of corn purchased by a food company. Carbon offsets can be applied to mitigate an organization's scope 1 and 2 emissions, while carbon insets can be applied to mitigate scope 3 activities. While protocols for measuring scope 1 and scope 2 are outlined in the Greenhouse Gas Protocol, protocols for measuring scope 3 emissions have not yet been finalized.

7. **USDA and Congress should systematically work to expand and improve existing conservation programs, drawing on CFAD's recommendations for investing in working lands conservation**: This includes making changes to expand enrollment, strengthen our network of technical assistance providers, and increase the accessibility of NRCS offices and resources to all producers. Adjusting programs to be more outcomes-based and reward producers based on the conservation benefits they have generated can also help maximize program impact. However, USDA should continue to build on recent investments to develop measuring, reporting, and verification tools that accurately quantify the ecosystem services of more diversified systems. This is critical to ensure that highly diversified systems are accurately rewarded for the complex ecosystem services they provide.

8. **USDA should offer technical assistance to states that wish to create programs that give producers who adopt or have adopted climate-smart agricultural practices regulatory certainty on compliance with environmental safeguard policies** (e.g., Clean Water Act requirements, Endangered Species Act).[8] Such programs benefit early innovators by providing regulatory certainty in exchange for the adoption and maintenance of climate-smart practices.

[8] For example, the Minnesota Agricultural Water Quality Certification Program (MAWQCP) is a statewide program in Minnesota designed to recognize and reward agricultural stewards of water quality. Farmers and landowners who treat risks to water quality are certified under the program and deemed in compliance with any new water quality laws or rules for 10 years. Certification gives farmers greater certainty about regulatory standards and assures the public that Minnesota's farmers are doing their part to protect and improve water quality.

Conclusion

The primary goals of our national agriculture-climate policy should be to maintain the progress that early innovators have achieved by using climate-smart agricultural practices while actively engaging new growers in adopting and expanding use of these practices.

While carbon markets offer one pathway to reward innovators of climate-smart practices, there are many other tools, even in the face of limited resources, that can be utilized to recognize and reward the work of agriculture's conservation leaders. The added value and profitability of climate-smart operations should be systemically rewarded through reduced crop insurance rates, increased land values, climate-smart commodity markets, ecosystem service markets, as well as preferential treatment from USDA programs and regulatory agencies.[9]

We need to use a variety of tools and applications to reward climate-smart agriculture – no single tool will work for all producers and production systems. **Only by constructing an agricultural system that consistently rewards conservation adoption will we be successful in expanding climate-smart agriculture at the magnitude required to help mitigate climate change.**

[9] We want to see climate action across U.S. working lands and would note a caution that USDA could inadvertently create additionality issues by paying for practices without producers being enrolled in markets. Past practices aren't eligible for credit generation so if producers take on new practices that could generate credits, they need to be enrolled to get market credit for those outcomes.

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Recommendations for Investing in Working Lands Conservation

Exponentially increasing regenerative farming practices on American agricultural land represents an incredible opportunity to generate benefits for the environment, agricultural producers, and society at large. America's working lands represent 40% of the nation's acreage[1]. Responsible, increased investments in working lands conservation and regenerative agriculture are critical to help the Biden administration reach its goal of negative emission farming and engaging 30% of the nation's land and water in conservation[2], as well as to reaching a growing number of climate commitments made by farm groups and food companies. A responsible balance between working and idle land conservation is the common-sense approach to reduce greenhouse gas emissions, improve soil health and water quality and quantity, and increase agricultural productivity. We can do this in a way that makes economic sense for producers and advances equitable access to federal conservation programs. **We need to expand the network of technical assistance providers and expertise available to farmers and ranchers. To accomplish these goals, we need to exponentially increase funding for existing conservation programs.** Ultimately, these recommendations will help USDA expand and streamline existing conservation programs for maximum impact.

CFAD has released two additional resources: USDA Research and Science Recommendations and a concept note for the development and operation of a USDA National "Climate Bank." Sustainable, climate-smart agriculture requires a suite of policies and a

About CFAD

AGree's Climate, Food, and Agriculture Dialogue brings together a diverse group of farmers, ranchers, and foresters; environmental NGOs; supply chain companies; and former government officials. CFAD members have divergent views of the issues and opportunities facing U.S. agriculture, but we share a common view that **climate change demands ambitious and durable federal policy solutions that are commensurate with the urgency and scale of the problem**. We see U.S. food and agriculture system as a crucial source of solutions to address climate change and the degradation of nature, which includes our land and water resources. These solutions must provide transparency and promote affordability while distributing costs and benefits in such a way that promotes equity and value to land managers. The scientific consensus that the climate is changing at an increasingly rapid pace is incontrovertible. The timeframe for taking meaningful action to avoid catastrophic impacts is running short. Our guiding principles for federal policy on climate change and food systems can be viewed here.

[1] https://www.nass.usda.gov/Publications/Todays_Reports/reports/fnlo0220.pdf

[2] Outlined in President Biden's Executive Order on Tackling the Climate Crisis at Home and Abroad.

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systems approach to bring lasting management changes. **CFAD is committed to working with USDA and Congress as they develop policy and programs that work for producers, the environment, and society.**

Introduction

Policies to expand conservation practices must be grounded in the perspective of farmers and ranchers, with an understanding of the barriers that a range of producers face to joining new federal programs. We know that many farmers and ranchers make farm management decisions on an annual basis, informed by current crop and livestock prices and their years of experience, in order to maximize their farm's production and profitability. Barriers to joining new programs include a backlog of applications and long waiting lists; a lack of clear, concise communication on the costs and benefits of conservation practices and programs; the complexity and paperwork involved in program enrollment; and, in some places, a technical assistance network that is stretched too thin or lacks the relevant expertise in nutrient management, irrigation management, feed management, soil health, organic transition, and new conservation technologies that producers need to make the best management decisions for their operation. The following policy recommendations are targeted to address these challenges and expand the federal conservation incentive and support system to effectively educate and enroll the greatest number and diversity of farmers.

The U.S. Department of Agriculture (USDA) and Congress have several immediate opportunities to promote climate smart agriculture throughout the United States. This set of policy recommendations outlines how USDA and Congress can:

I. Exponentially increase conservation program funding,

II. Elevate a focus on conservation and climate solutions at USDA,

III. Tailor existing conservation programs to maximize effectiveness and promote whole-farm conservation planning,

IV. Expand and improve technical assistance for conservation adoption, and

V. Align financial incentives to recognize the financial and risk-reduction benefits of conservation.

As USDA considers how to best align farm programs and financial mechanisms towards promoting conservation, the following guideposts should be kept in mind:

1. **Ensure farmer profitability is at the forefront of efforts to expand conservation practice adoption**. Creating new economic opportunities for farmers is critical to expanding voluntary adoption of conservation practices and creating a successful and resilient agricultural system.
2. **Ensure that the full diversity of American agricultural producers can participate in incentive programs**, with a particular focus on including Black and Indigenous farmers, young and beginning farmers, small and midsize farmers, and farmers who grow a diversity of crops and/or integrated crop-livestock systems.

3. **Create ecosystem services, maintain or increase biodiversity, and reduce the overall footprint of farming**, while considering environmental impacts beyond just sequestering carbon to include other greenhouse gas emissions reductions, soil health improvements, water quality and quantity enhancements, and wildlife and pollinator habitat protection.
4. **Start with incentivizing practices that we know are effective based on best science and evidence** (e.g., cover cropping, crop rotations, rotational grazing, nutrient management, manure management, irrigation management, etc.) in order to start making progress while research continues on other critical practices.
5. **Invest in systems to monitor and measure the outcomes of practices and programs.** This is critical to ensure that the benefits of conservation programs are being realized. Landscape-level monitoring is essential to build consensus that USDA programs are effective tools for reducing greenhouse gas emissions. In addition to further developing USDA tools such as COMET Planner, there is a need for more regional and industry-specific modeling tools to effectively measure practice outcomes across diverse geographies, climates, soil types, and production systems.
6. **Consider the long-term adoption of conservation practices, permanence of ecosystem services, and the advantages of early action by farmers.** Congress and USDA should continue to incentivize early adopters to maintain the benefits of their practices and encourage further innovation that can lay the groundwork for scalable adoption of more practices.
7. **Strive to incentivize continuous improvements.** Programs such as the Conservation Stewardship Program (CSP) help support lasting change, continual improvement, and measurable impact through long-term, renewable contracts.
8. **Avoid sending mixed signals or creating perverse incentives**. There is a need to create shared, understood objectives for agriculture policy to ensure different policies do not work at cross-purposes.

The policy recommendations outlined herein advance these principles by centering the advice and guidance from producers to design programs that will work for them, by suggesting ways to expand and improve our current conservation delivery system to advance whole-farm ecosystem planning and by providing thought leadership about the challenge of incentivizing early adopters to maintain their historic practices and progress. If implemented, the policy recommendations outlined in the following pages will advance these ideals and support our transition towards more climate-resilient and profitable agricultural and forestry systems.

I. Exponentially Increase New Funding for Existing Conservation Programs

Congress should provide USDA a three- to five-fold increase in new funding for conservation programs in order to expand adoption of conservation practices as quickly as possible on working lands. The

2021 fiscal year budget for NRCS conservation programs is $3.9 billion[3], therefore we suggest increasing funding to between $11.7 - $19.5 billion to accomplish our climate goals. Increasing conservation program funding is critical to expanding conservation adoption, especially because the last increase in program funding occurred in the 2008 fam bill, and program dollars have levelled off or decreased since then[4]. A significant increase in conservation funding is the quickest strategy to immediately increase conservation adoption, directly benefit farmers and ranchers, and begin delivering immediate increases in carbon sequestration, emissions reductions, and other environmental benefits that working lands provide. Furthermore, a growing number of policymakers and agricultural groups support this idea[5].

The Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), and Regional Conservation Partnership Program (RCPP) are three voluntary, incentive-based conservation programs that we know are effective in expanding conservation on the ground. In 2020, EQIP contracts enrolled 3.8 million acres of farmland in at least one cropland soil quality practice[6], and the CSP program had 6.4 million acres enrolled in active, comprehensive, whole-farm conservation contracts[7]. A review of 26 research trials conducted by Sustainable Agriculture Research and Education program (SARE) suggests that cover crops have the potential to sequester 3 metric tons of CO_2-equivalents (CO_2e) per acre per year[8]. Using this metric, **increasing cover crop adoption by 30 million acres through increased conservation program funding could sequester an additional 90 million tons of CO_2e annually.**

The Regional Conservation Partnership Program (RCPP) is unique in that it allows NRCS to partner with local organizations and communities to address natural resource goals at the regional level. Since 2014, RCPP has funded over 375 high-impact projects across the U.S., bringing in an estimated $2 billion in matching funding from partners[9]. RCPP is a model for leveraging partnerships and partner funding to achieve maximum impact from federal conservation dollars and could be expanded, particularly through the program's Alternative Funding Arrangements (ARA), with a focus on targeting climate-smart agricultural practices.

Despite the success of NRCS conservation programs, they have long waiting lists and low acceptance rates due to lack of funds. Historically, USDA has only been able to accept one-quarter of applications received for conservation programs. Exponentially increasing conservation program funding will allow

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[3] https://www.usda.gov/sites/default/files/documents/usda-fy2021-budget-summary.pdf

[4] https://www.ers.usda.gov/topics/natural-resources-environment/conservation-programs/

[5] A growing number of policymakers and agricultural groups support an increase in conservation program funding. A recent letter signed by 133 leading farm groups recently suggested a doubling of conservation program funding. The Food and Agriculture Climate Alliance (FACA), consisting of almost 70 agriculture, food, forestry, and environmental organizations, has suggested a 20% increase in program funding. Senator Cory Booker and Congresswoman Abigail Spanberger introduced the Climate Stewardship Act, which calls for nearly doubling the Conservation Reserve Program to 40 million acres a year and increasing funding for both the Conservation Stewardship Program and the Environmental Quality Incentives Program to $7 billion a year. The Agriculture Resilience Act introduced by Congresswoman Pingree and Senator Heinrich also calls for robust investments in federal conservation programs. In addition, Senate Agriculture Chairwoman Debbie Stabenow has made public remarks pushing for a major increase in conservation program funding.

[6] https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_eqip.html

[7] https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_cstp.html

[8] https://www.sare.org/publications/cover-crops/ecosystem-services/cover-crops-and-carbon-sequestration/

[9] https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/rcpp/

NRCS to fund and execute more contracts, hire additional technical assistance personnel, and ultimately leverage NRCS's existing infrastructure to expand conservation, carbon sequestration, and environmental benefits as quickly as possible.

Ensuring Equitable Access to USDA Resources

In addition to exponentially increasing conservation program funding, measures should be taken to ensure these resources are accessible to small, beginning, Black, Indigenous, and People of Color (BIPOC), and socially or economically disadvantaged farmers and ranchers. USDA's history of discrimination against BIPOC farmers in allocating loans and conservation payments has led to a lack of trust with producers of color, which USDA must take steps to address. In addition, producers with less time and fewer resources to learn about and navigate USDA programs are often left out of funding and cost-share opportunities. However, we know that engaging the full diversity of U.S. agriculture in climate-smart practices is critical to addressing climate change and ensuring the benefits of new funding are equitably distributed.

In order to reduce barriers for small, beginning, and BIPOC farmers and ranchers to engaging in USDA programs, we suggest USDA place a high priority on expanding funding for non-traditional technical assistance providers that already work with these producers. For example, the Intertribal Agriculture Council plays a key role in assisting Indian producers in accessing and using USDA programs and services. In addition, streamlining existing conservation programs, fast-tracking approval and funding for conservation plans that propose to implement well-understood practices, and offering producers assistance with creating whole-farm conservation plans can help reduce barriers to engaging in USDA programs and support conservation planning for producers with fewer resources. These policy ideas are further explored later in this document.

II. Elevate a Focus on Conservation and Climate Solutions at USDA

To ensure that climate efforts at USDA are effective, strategic, and widely supported, USDA should revise the mission statement and goals for each USDA agency to create a clear and prominent focus on climate-smart agricultural practices. Agencies should be directed to prioritize conservation practices that not only sequester carbon but include co-benefits for nature including improved soil health, water quality, and wildlife habitat. Articulating a department-wide vision for on-farm outcomes (both economic and environmental) and conservation outcomes at the landscape and watershed levels would help to drive strategic decision making by individual agencies and programs.

Taking steps to improve data collection, analysis, and sharing between agencies will help USDA achieve these conservation and climate goals. Increased integration and analysis of this agricultural data is key to understanding how the food and agriculture sector can develop and implement solutions

to climate change (read CFAD's Research Recommendations for more detailed recommendations about USDA research and science on climate-smart agriculture). Existing tools such as COMET-planner can be used to provide guidance for the most impactful practices by farming systems to prioritize, as well as create proxies for measuring practice outcomes while more comprehensive monitoring and measurement systems are developed.

As USDA works to advance its data infrastructure and analysis, the agency should ensure that data architecture for USDA conservation planning and programs provides value back to producers. Producers should be able to electronically access the data they provide to UDSA and all available USDA planning tools and incentives available to them. USDA data systems should be aligned with the tools and technologies producers need to use to participate in ecosystem services markets. USDA should expand efforts toward data interoperability to enable producers to enter data once and use it many times. This is critical to building the value proposition for producers to share their data.

III. Tailor Existing Conservation Programs to Maximize Effectiveness and Promote Whole-Farm Conservation Planning

USDA should adjust existing conservation programs to streamline program enrollment and administration, reduce barriers to enrolling in conservation programs, better communicate the benefits of climate smart farming practices, and provide assistance for farms to optimize conservation benefits. While current conservation programs are generally effective, adjusting contract structures can reduce the significant administrative burden currently facing NRCS staff, freeing up more time to work directly with farmers on conservation planning and implementation. In addition, a stronger focus on conservation and climate planning can support farmers and ranchers in understanding how their farm management can most effectively contribute to climate mitigation efforts. Improving USDA program accessibility and ensuring support for conservation planning is widely available can help small, beginning, and BIPOC producers access program benefits.

CFAD policy recommendations to achieve this goal include:

- **Offer assistance for farms to develop conservation plans specifically tailored to optimize environmental benefits and increase production resilience to climate change impacts** while considering the economic realities of each farm. USDA should move immediately to implement a provision included in the 2018 farm bill to provide producers a one-time payment for comprehensive conservation planning. Current programs such as EQIP and CSP can also promote a holistic understanding of climate mitigation and encourage the adoption of practices with environmental benefits beyond carbon sequestration, such as nutrient and irrigation management. This can also be advanced by creating bundles of climate practices and enhancements that, when combined, will decrease emissions, increase carbon sequestration, and provide long-term farm resiliency for participating farmers and ranchers. This could include bundles for feed management for livestock to reduce emissions, rice system management to reduce methane emissions, crop rotations to improve soil health, and/or a nutrient management program to increase nitrogen use efficiency.

- **Fast-track conservation plans and contracts for conservation practices that are well-understood, easy to implement, and scalable, such as cover cropping, conservation tillage, and irrigation management.** This must be done in combination with a significant increase in conservation program funding, so farmers who have been waiting to have contracts processed are not disadvantaged. Whole-farm conservation plans should not be a pre-requisite for producers interested in adopting specific conservation practices, since these can present a roadblock to conservation adoption and discourage participation.
- **Prioritize the implementation of a narrower range of individual practices with scientifically supported impact values (e.g., climate, water, and biodiversity) among certain farming systems in specific regions**. A shorter list of "climate practices" will help various and diverse producers choose the most impactful practices to assist in building their own distinct agricultural management systems. States and regions can choose the practices that are most practical for the farm-systems that operate in specific areas.
- **Create multi-year EQIP contracts with declining payments over time,** whereby a producer receives a smaller cost share payment each year as transaction costs decline. Implementing some conservation practices can have a high up-front cost, but as practices become established, they begin to produce greater benefits over time. A declining payment structure provides a greater incentive upfront, when it is needed by producers, and then declines to reflect the reduced cost and increasing benefits to the farm. Farmers who are starting their conservation journeys could apply for an EQIP contract, and after one or two contracts, farmers could then be eligible to "graduate" to CSP to maintain and expand their conservation practices.
- **Prioritize multi-practice, multi-year incentive contracts.** For example, EQIP and CSP contracts focusing on climate impacts and/or soil health should prioritize producers who desire to adopt multiple practices for multiple years, therefore increasing the odds of measurable impact and lasting behavior change. Prioritizing multi-practice, multi-year contracts reduce the need for additional transactions in the future, thereby streamlining program administration. The CSP program provides multi-year, renewable contracts to support lasting change, continual improvement, and measurable impact.

IV. Expand and Improve Technical Assistance for Conservation Adoption

USDA and Congress should increase funding for technical assistance, invest in training and technology dissemination, and expand the use of partnerships to bolster and improve technical assistance. Technical assistance is critical to providing the information and guidance needed for producers to feel confident in adopting new practices and to supporting new, beginning, and BIPOC farmers in enrolling in USDA programs. Producers need clear, streamlined communications from USDA about what programs are available and what support they can access. Creating additional flexibility and resources for NRCS field office personnel to partner with agricultural extension offices, local conservation districts, and non-traditional technical service providers can help expand capacity and address gaps in NRCS expertise. In addition, there may be creative opportunities for cross-training and expertise sharing within programs at USDA. For example, a partnership between NRCS and the USDA National Organic Program could enlist

accredited organic certifying agents to deliver technical assistance to conservation during the production off-season.

Many NRCS field offices have limited expertise in several areas critical for climate planning, including livestock feed management, improved nutrient management for crops, irrigation management, pasture and advanced grazing management, soil fertility, cover crops, perennial agriculture, diverse cropping systems, new technologies that can help mitigate the environmental impacts of farming, and the economic return on investment for regenerative farming practices. Immediately addressing these expertise gaps is essential to providing farmers and ranchers the best available information for improving the profitability and climate resilience of their operations.

CFAD recommendations to improve and expand technical assistance include:

- **Increase funding for technical assistance.** Increase technical assistance funding and support for NRCS field offices, conservation districts, and technical assistance cooperators. Additional funding is needed to expand overall capacity and ensure additional technical assistance support does not affect conservation incentives provided through EQIP and CSP.

- **Invest in training and technology dissemination for NGOs, conservation community, extension, and NRCS personnel.** There is an immediate and urgent need to train NRCS field staff and technical assistance cooperators on climate issues, programs, policies, and emerging technologies (e.g., manure management) that can help drive adoption of climate solutions on working lands.

- **Invest in programs such as 4-H, Future Farmers of America (FFA), and the National Conservation Foundation Envirothon that create a pipeline for young people to become interested in agricultural extension.** In order to expand interest in and continue the legacy of a strong U.S. agricultural industry, we need to build and train a generation of smart, motivated young people who are excited to work as farmers, technical assistance providers, and extension agents.

- **Expand technical assistance partnerships through:**

    - **Increasing the use of cooperative agreements to provide non-federal partners more flexibility** and avoiding the complexity and underutilization of the current Technical Service Provider certification process. These cooperative relationships should be designed to expand NRCS's capacity to provide climate resilience and carbon management expertise.
    - **Utilizing Conservation Stewardship Program (CSP) enhancements or Crop Assistance Program (CAP) payments to pay for the use of third-party advisors for climate management.**

- **Support and promote peer-to-peer farmer networks.** Farmers sharing their experiences and knowledge with one another is a powerful strategy to build momentum and support for climate-smart agriculture.
    - One model for creating these opportunities through USDA programs is the NRCS Grazing Lands Conservation Initiative, which enlists state committees and grassroots coalitions

that find opportunities to increase technical assistance and create public awareness of activities that maintain or enhance grazing land resources. This model could be replicated to leverage the knowledge and experiences of early adopters to build trust and expand climate-smart agricultural practices.

- The Climate Adaptation Fellowship is another peer-to-peer model that provides farmers, foresters, and advisor the information they need to adapt to climate change. This curriculum was developed through a partnership between several universities, the USDA Northeast Climate, NRCS, and other partners, and is another model for collaborative extension efforts.

V. Align Financial Incentives for Conservation

The purpose of federal conservation programs is to incentivize and support farmers and ranchers in adopting new conservation practices that provide societal and environmental benefits. Producers who receive this support should then be enabled to monetize the environmental benefits through enrolling in private ecosystem service markets. **The role of the government is to provide support where there is a failure of private markets to reward public goods. This includes creating financial incentives for producers who are transitioning to new conservation practice adoption and for early adopters.** It is also important to note that any policy that USDA develops must allow for and recognize existing private markets and not adversely impact, interfere or duplicate private sector efforts. To align incentives for conservation, CFAD recommends:

- **Transition payments for producers adopting new conservation practices**. Producers transitioning to new conservation practices may experience temporary declines in farm profitability (e.g., no-till has a 5–7-year transition period), during which the ecosystem benefits of practices are also not fully realized and cannot be monetized. USDA's organic transition payment program could be expanded to include a conservation transition payment to support producers as they make this transition. The recommendations above to streamline conservation programs, reduce barriers to entry, and lower transaction costs will also help increase the number of producers transitioning to conservation practice adoption.
- **Create crop insurance discounts or premium reductions that recognize the increased soil health and reduced agricultural risk of farms implementing conservation practices to provide financial incentives for early adopters to continue their practices.** Similar incentives for the Noninsured Crop Disaster Assistance Program (NAP), Whole Farm Revenue Program (WFRP), and Agricultural Management Assistance (AMA) Program should also be developed to ensure that non-row crop and diversified farmers can access these benefits. Designing incentives for early adopters of conservation practices to maintain the environmental benefits they have already created is critical to reward these public goods and prevent backsliding as producers adopting new practices are rewarded through private ecosystem service markets. **However, not all farmers utilize crop insurance, so this strategy is not a silver bullet and must be combined with other strategies to reward early adopters for the ecosystem services they provide**.
- **Clarify that all NRCS conservation practices and standards are Good Farming Practices (GFP).** Farmers who implement conservation practices and enhancements in line with NRCS

standards should not find themselves in conflict with RMA rules as a result. Conservation is a key element of risk management, and RMA rules and policies should reflect this understanding. RMA and NRCS, two Farm Production and Conservation (FPAC) agencies, should coordinate so that neither issues a contradictory rule or recommendation that impacts farmers.

Two unresolved challenges are how to ensure that tenant farmers can access conservation programs and incentives, and how to design robust incentives for early adopters of conservation practices to maintain the environmental benefits they have already created. Benefits already generated by early adoption of conservation will be difficult, if not impossible, to reward through private markets. CFAD has outlined a suite of policy options for USDA and Congress to consider, including rewarding early adopters through crop insurance discounts and/or through a USDA National Climate Bank (see CFAD's Climate Bank Concept Note for more information about how this could be done). As policy conversations continue, we will stay abreast of these challenges and provide more robust recommendations and thought leadership in the future.

Conclusion

Climate change solutions must be grounded in the perspective of agricultural producers who are key to driving conservation on working lands. An exponential increase in funding for existing conservation programs is required to drive the conservation practice adoption needed in a timely, voluntary, and incentive-based way. An integrated, USDA-wide focus on climate-smart conservation practices, improved agriculture data systems, expanded technical assistance for conservation adoption, and aligned financial incentives to recognize the financial and risk-reduction benefits of conservation can help reach these goals. Furthermore, investments in measuring and monitoring the outcomes of conservation programs and practices will build the confidence that programs are delivering the public benefits they promise. Ultimately, expanding, improving, and targeting existing conservation programs can build the business case for climate-smart agricultural practices and drive the management changes needed across millions of acres of U.S. working lands.

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Recommendations to Strengthen USDA's Support of Research and Science for Climate-Smart Agriculture

Robust and targeted research and science are fundamental to U.S. food and agriculture's response to climate change and our ability to leverage the sector to provide natural climate solutions. Our food system is vulnerable to a changing climate but also has the potential to mitigate greenhouse gases through innovative natural climate solutions that build soil health, farm resilience, and deliver ecosystem services to rural and urban communities alike. We need a research enterprise that is laser focused on the challenges before us. We need a national effort on improving soil health; soil carbon sequestration research, measurement, and verification techniques; animal feeds that reduce enteric emissions; and new seed varieties including cover crops that help us sequester more carbon or are otherwise adapted to climate change. We need a strong evidence-base to underpin public and private investment. We also need economic research and behavioral studies about new practice adoption, along with continuously improving models and predictive capacity. Strong USDA investment in research will enable U.S. agriculture to harness mitigation and market opportunities and meet the challenge of a changing climate head on.

About CFAD

AGree's Climate, Food, and Agriculture Dialogue includes farmers, ranchers, and foresters; environmental NGOs; supply chain companies; and former government officials. We share a common view that **climate change demands ambitious and durable federal policy solutions that are commensurate with the urgency and scale of the problem.** We see U.S. food and agriculture system as a crucial source of solutions to climate change. These solutions must provide transparency and promote affordability while distributing costs and benefits in such a way that promotes equity and value to land managers. The scientific consensus that the climate is changing at an increasingly rapid pace is incontrovertible. The timeframe for taking meaningful action to avoid catastrophic impacts is running short. Our guiding principles for federal policy on climate change and food systems can be viewed here.

CFAD is also releasing two additional resources: a set of recommendations for investing in federal programs to expand on-farm conservation adoption and a concept note for the development and operation of a USDA "Climate Bank," creating financial incentives for land management innovation on hundreds of millions of acres of working lands to curb the effects of climate change. These actions will promote broader adoption of agricultural conservation practices on working lands and improve farm profitability, increase resilience, reduce risk, enhance environmental performance, and sequester carbon. USDA has the opportunity to send a strong signal to farmers, ranchers, and foresters; the supply chain; and the American public that our food system is committing to climate-smart agriculture and forging a path toward net zero emissions. CFAD looks forward to working with USDA and Congress as they develop policy and programs that work for producers, the environment, and society.

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Introduction

USDA is the leading funder of basic and applied agricultural research, through both intramural and competitive mechanisms. In this document, we outline priorities to enable USDA to bring climate change mitigation solutions within a broader scope of federal and private investment in agricultural research. Research to support producers' ability to adapt to the variable conditions caused by climate change is important but is not the subject of this paper.

Federal climate change mitigation research spans multiple USDA research and extension agencies and programs, as well as other federal agencies. Much is already known about agricultural practices and technologies that can reduce emissions or sequester carbon while contributing to soil health or other agronomic goals. Collectively, we refer to systems that use these practices and technologies as "climate-smart agriculture."

Research can improve the evidence base around climate-smart agriculture where there are still gaps, identify and inform strategies to overcome barriers to adoption at scale, monitor trends in GHG emissions and sequestration on agricultural and forest lands, and align goals at the farm scale with those of ecosystems and society at larger scales. Our recommendations focus on USDA and its federal partners as these provide the largest levers to achieve scale of mitigation. At the same time, these recommended actions will support and expand upon important work being conducted by land grant institutions, other universities and institutes, the Foundation for Food and Agriculture Research (FFAR), commodity and grower groups, and the private sector.

Goals and Objectives

For USDA to achieve its goal of advancing climate-smart agriculture, it must strategically align its vast research expertise and resources. A climate-smart agriculture research enterprise should be developed that coordinates economic, social, and environmental sustainability research across USDA mission areas, the US government, and non-federal research partners and builds the research infrastructure needed to facilitate this important work.

USDA research needs to be precompetitive, scalable, and benefit all farmers, ranchers, and foresters in order to achieve near term impacts and position the diversity of U.S. agricultural systems to make ambitious and durable contributions to climate change mitigation. We recommend that USDA's research and science programs focus on a limited number of specific objectives to achieve this goal:

I. Coordinate science and research to maximize the effectiveness and impact of public investments.

II. Build the business case for climate-smart agricultural practices, including the case for public benefits and public investments in farmer incentive programs.

III. Improve USDA data sharing policies and infrastructure to facilitate research conducted by trusted partners.

IV. Support equitable engagement by diverse producers and agricultural systems.

V. Improve the rigor of climate models and measurements to support the U.S. Greenhouse Gas Inventory and reduce risk in private environmental markets.

VI. Create new tools and practices to expand the climate-smart agriculture toolkit.

I. Coordinate Science and Research

Coordinating USDA's climate research investments is critical to ensure that USDA funding has the greatest impact and best complements and leverages private sector research investments.

USDA's immediate, highest priority should be to create a "Climate Research Coordinator" position to develop a coherent "all of USDA" climate research strategy across its agencies, coordinate climate research with other federal agencies, and engage with external research stakeholders. This position could be created in the Office of Chief Scientist to work with the Secretary's USDA Climate Advisor and other climate research leads within USDA.

A Climate Research Coordinator should be tasked with preparing an inventory of USDA climate mitigation and adaptation research to better leverage existing efforts, identify gaps for future research, and avoid duplication in efforts. This inventory should include research conducted by the Office of Research, Education and Economics (ARS, ERS, NIFA, AFRI, NASS), plus the Office of Farm Production and Conservation (NRCS, RMA, FSA) and the Office for Trade and Foreign Agriculture Affairs (FAS), as well as other federal agencies engaging in climate research including the Environmental Protection Agency, National Science Foundation, U.S. Geologic Service, Department of the Interior, Department of Energy, and USAID.

USDA should publicly release an annual report of the inventory's findings and host "state of the science" meetings to engage the research community and other stakeholders. External research stakeholders that should be engaged include historically black colleges and universities, land grant institutions, food and agriculture technology companies, foundations, think tanks, forestry and agricultural groups, non-governmental organizations, and leading public and private sector researchers from the international community.

In addition to coordinating research moving forward, USDA should analyze existing research archives to mine datasets that can provide useful insights moving forward. Historic information can be used to build the evidence base for climate-smart practices and support efforts to set industry baselines for carbon sequestration. Understanding the body of agricultural research to date will support the Climate Research Coordinator in developing a cohesive and informed research agenda moving forward.

II. Build the Business Case for Climate-Smart Practices

Farmers, ranchers, and foresters will only adopt climate-smart practices at the rate needed to substantially reduce agricultural emissions once they understand the clear economic benefits of doing so. USDA-supported intramural and extramural research can play a critical role in building this business case for co-investments in climate-smart agriculture practices by individual producers while articulating

the return on investment to society from public investment and supporting development of the private marketplace.

USDA should direct research assets to conduct precompetitive analysis and modeling that demonstrates the economic value associated with climate-smart agriculture practices, including by:

- Estimate the cost of implementation and return on investment for individual growers that adopt individual or stacked climate-smart practices.
- Quantify the public benefits derived from climate-smart practices, including landscape-level impacts. These could include linked benefits between working lands and built environments for flood risk reduction, water quality improvements or fire risk reduction (e.g., Iowa Watershed Approach funded by HUD), as well efforts to quantify multiple benefits from existing farm programs like the Conservation Reserve Program.
- Research the longevity and durability of environmental benefits from climate-smart practices, including dynamics such as the relationship between the length of practice implementation and accrual of soil carbon, the effects of practice reversion/termination and variability across geographies and production systems.
- Study potential positive and negative impacts of current federal policy incentives on conservation practice adoption and crop and livestock diversification, including how adjustments to the federal crop insurance could promote conservation. This work could also consider the use of Marketing Assistance Loans for diversification of farming operations.

This research should consider impacts of climate-smart practices on the diversity of agricultural operations, including dynamics such as size, region, commodity, and level of capital that can influence profitability. Building the business case for conservation is a keystone for increasing adoption of practices and should be a priority that is expressed in research projects across the board, not segmented into siloed research projects. Most importantly, the findings must be shared with producers and other agriculture stakeholders. Technical assistance providers, particularly NRCS field offices and land grant university extension offices, can help with disseminating information to producers that is specific to their geographic area.

III. Improve USDA Data Sharing Policies and Infrastructure

Connecting the extensive agricultural research community to USDA's vast agricultural datasets is a critical strategy to quickly and efficiently answer key research questions about the multiple benefits of climate-smart agricultural practices while building trust across the agricultural research community.

USDA should engage trusted research partners in advancing USDA research priorities by developing data sharing and research infrastructure that allows farmers and university researchers to access anonymized USDA datasets. The scale and scope of the agriculture research investments needed to meet the climate crisis can be accomplished through developing partnerships with land grant universities, commodity groups, and others. USDA has several datasets that can be used by external researchers to relate conservation practices to farm profitability, helping to build the business case for climate-smart agriculture.

USDA data infrastructure should be modernized in a way that respects farmer data privacy and autonomy, reduces reporting burden, and communicates useful research conclusions back to producers to inform decision-making. By investing in improvements to data collection systems and streamlining data management processes, USDA can simplify the data reporting process, which is overly burdensome for many farmers and ranchers. Creating channels to clearly communicate how producer data is being used, allowing producers to opt in or out of research projects, and allowing producers that opt in to easily access their data and research results can build trust in the farmer and rancher community that their data is being used responsibly and effectively to generate knowledge that will ultimately benefit their operations.

IV. Support Equitable Engagement by Diverse Farmers, Ranchers, and Farming Systems

For the entire agricultural sector to succeed in reducing its emissions, all types of producers must be engaged. **USDA should therefore ensure that diverse farmers, ranchers, and farming systems can participate in federal conservation programs and adopt climate-smart agricultural practices.** This is key to reaching scale of adoption in an equitable way. Strategies for supporting equitable producer engagement include:

- Partner with state Departments of Agriculture, land grant cooperative extension offices, and NGOs to expand extension and outreach, particularly to small and disadvantaged farmers and non-operating landowners.
- Conduct engagement and extension to historically disadvantaged farmers and ranchers, drawing from examples in the Sustainable Agriculture Research and Education (SARE) program.
- Conduct social science research to identify barriers to adoption of climate-smart agriculture practices. In particular, study barriers to participation in USDA conservation incentive programs by diverse agricultural producers and producers who rent farmland. Use these findings to identify ways to adjust programs to encourage robust participation.
- Consider the impacts of climate-smart practices on the diversity of agricultural operations, including dynamics such as size, region, commodity, and level of capital that can influence profitability.
- Expand the Specialty Crop Block Grant program to include more emphasis on mitigation practices across the diversity of regional farming systems in coordination with state Departments of Agriculture.

V. Improve the Rigor of Climate Models and Measurements

USDA should improve the rigor and transparency of climate models and measurements to support the efforts of the U.S. Greenhouse Gas Inventory and private ecosystem service markets. Research and science can help ensure that federal investments in climate-smart agriculture and forestry are backed by strong science, using both intramural and extramural research to build the evidence base around the contribution of agricultural practices to greenhouse gas emissions and carbon sequestration. A national

monitoring system that addresses both field-scale and landscape-level climate impacts in particular could enhance the rigor of the measurements and models that underlie public investments and private markets. There is an opportunity to scale up soil monitoring systems now, while developing new technologies that will drive down costs in the future. **The following measures will help USDA build the foundational knowledge necessary to measure the climate impacts of agricultural systems and practices with greater rigor than current efforts can achieve:**

- Improve the modeling of greenhouse gas emissions and carbon sequestration in agricultural soils by funding and conducting research to improve baselines and account for regional variability, greater differentiation of crops and livestock, forestry systems, increased spatial resolution and sources of uncertainty.
- Establish a national soil carbon and nitrous oxide emissions monitoring network, leveraging Agricultural Research Service and Natural Resource Conservation Service research sites together with land grant universities. Research the durability of carbon sequestration, including dynamics such as the relationship between the length of practice implementation and accrual of soil carbon, effects of practice reversion and termination.
- Integrate remote sensing tools (e.g., LIDAR, satellite imagery) with Forest Inventory and Analysis (FIA) and other field plots to improve accuracy and resolution of estimates of greenhouse gas emissions and sequestration in woody biomass (including forests, trees in croplands and grasslands, and urban trees).
- Increase the frequency of the Conservation Effects Assessment Project (CEAP) and add specific climate research objectives to enhance understanding of the relationship between conservation practices, greenhouse gas emissions, and carbon sequestration.
- Develop and pilot more precise and cost-effective carbon measurement tools for agricultural soils.
- Assess and coordinate USDA, DOE and ARPA-E SMARTFARM programs to research and quantify the net greenhouse gas footprint from different biofuel feedstocks, including land use impacts and opportunities for expanded use of agricultural biomass and processing food loss and waste.
- Link the National Soil Web Survey and the National Resources Inventory to better leverage these tools for monitoring changes in soil carbon storage.

VI. Expand the Climate-smart Ag Toolkit

USDA should expand knowledge of climate-smart agricultural practices and develop new practices to accelerate climate change mitigation progress across the full diversity of U.S. production systems. There is a strong body of existing knowledge about the benefits of common conservation practices in major row cropping systems (e.g., cover cropping and no till) that can be leveraged to expand adoption of some practices today, recognizing variations in efficacy across different geographies and production systems. However, there is also a need to develop new strategies and practices, particularly for other crops; new crop varieties that are both more resilient to climate change and have a smaller GHG footprint; more tools for the major sources of emissions from livestock and nitrogen application; bioenergy from crop, food processing and livestock waste management; and on-farm energy use. Tools that work with the constraints and economics of smaller operations should be considered.

Some research initiatives to expand the climate-smart agriculture toolkit may fit within existing intramural and extramural research initiatives, such as within the Agricultural Research Service (ARS), NIFA's Agriculture Food Research Initiative (AFRI), or through partnership with the Foundation for Food and Ag Research (FFAR). Options that carry too much risk or lack sufficient commercial applications for existing research initiatives to take on may be prioritized by the Agriculture Advanced Research and Development Authority (AGARDA), as soon as that new authority receives congressional appropriations and has a leader nominated by the administration. All of these federal research initiatives should coordinate with ongoing private sector efforts to develop innovative agriculture technologies so as to complement rather than duplicate those efforts.

The following recommendations are designed to help USDA fill existing practice and knowledge gaps to facilitate broader practice adoption among U.S. producers.

- Invest in research and development in crop breeding for deep-rooted or perennialized analogues to current commodity crops that would sequester more carbon in root systems.
- Research, validate, and pilot commercial technologies, such as nitrogen inhibitors, soil carbon measurement tools and livestock feed additives, to inform food and ag sector decision-making.
- Conduct research into new ways to reduce emissions from nitrogen fertilizers, enteric fermentation, and manure management.
- Invest in improving tools and practices for diverse farming operations, such as farms that grow multiple crops and integrated crop-livestock systems.
- Research embedded energy in irrigation and other farm management as a basis for considering expansion of incentives for on-farm energy use, including replacement of less energy efficient farming equipment.
- Review opportunities for utilization of agricultural biomass and food processing waste streams, including bioenergy production and pyrolysis to create biochar.
- Audit the state of the science on climate impacts of various livestock and grazing practices and determine which are most likely to reduce risks and contribute to climate change mitigation.
- Advance options for carbon sequestration and emission reductions through aquaculture, including emerging opportunities such as kelp farming.
- Research plant genomics to identify varietals or specific genes that could be enhanced to provide benefits for climate change mitigation or resilience.

Conclusion

Climate change solutions must be supported by research and science. The solutions must be inclusive of the diverse interests that make up our food and agriculture system, which can be both a contributor and a solution to climate change. Coordinating the science and research to maximize effectiveness and the impact of public investments is imperative. If we can use our research enterprise to build a data-driven business case for climate-smart agricultural practices, we can create appropriate incentives and adoption to drive the management changes we need to see across U.S. working lands.

The AGree platform includes the AGree Economic and Environmental Risk Coalition (AGree E2 Coalition) and the AGree Climate, Food, and Ag Dialogue (CFAD).

THE AGREE ECONOMIC AND ENVIRONMENTAL RISK COALITION advocates for federal policy improvements to bridge the gap between the adoption of on-farm conservation practices and improved profitability for farmers and ranchers. Through collaboration and frank discussion, our work on crop insurance, agriculture data access, cover crops, and banking and finance is advancing the agricultural sector's movement toward a more resilient, profitable, and sustainable American agricultural system. Visit FoodandAgPolicy.org to learn more and join our effort to transform federal food and agriculture policy to meet the challenges of the future.

THE AGREE CLIMATE, FOOD, AND AG DIALOGUE (CFAD) is a diverse and pragmatic group of climate, food, former government officials, and agriculture leaders working to promote federal action on climate that is inclusive of food and agriculture. CFAD includes producers, food and agriculture companies, former government officials, and civil society organizations working together to promote federal action on climate change that is commensurate with the urgency and scale of the climate crisis. Visit ClimateFoodAg.org to learn more about our work and read our guiding principles for federal climate policy solutions.