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.

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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 non-profit 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

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\(^1\) 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).
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-plant ed 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).

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.

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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.
References Cited


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 includes producers, food and agriculture companies, 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.

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