American Farmland Trust

Developing a USDA Cover Crop Initiative

This document, focusing on the creation of a Cover Crop Initiative within USDA, is one in a five-part series of transition recommendations from AFT to the Biden Administration. The full set of recommendations can be found here. Please note that these recommendations are not intended to represent the full breadth of policies supported by AFT. Rather, they were chosen because they could be swiftly implemented without congressional action. AFT recognizes that there are many other challenges facing agriculture and we look forward to working with the Biden Administration, Congress, and other stakeholders to achieve lasting solutions.

SUMMARY

AFT recommends that the Biden Administration create a USDA-wide initiative to serve as a catalyst for broader cover crop adoption as a key step toward harnessing agriculture to help solve the climate crisis. Cover crops are planted after the primary crop is harvested in order to "cover" the soil during the fallow season, protecting it from erosion and leaching. They are a proven, low-cost natural climate solution, capable of sequestering atmospheric carbon dioxide (CO_2) into soils. AFT estimates that roughly tripling cover crop adoption from the current 15.4 million acres to 44.4 million acres could reduce CO_2-equivalent (CO_2e) emissions by 14.5 million metric tons annually. In addition, cover crops have numerous other benefits, including improving water quality and the bottom line for farmers, all while making soil more resilient to the extreme weather presented by climate change.

Securing widespread cover crop adoption will require a surge of federal support, technical assistance, and agency coordination. This paper briefly discusses the impacts of climate change on agriculture and explores the benefits of cover crops, barriers to their implementation, and steps that USDA can take to expand their adoption.

BACKGROUND

Agriculture and Climate Change

Atmospheric CO_2 concentrations hit an all-time high in 2019, underscoring the importance of immediate action to limit the impacts of climate change.[1] Farmers and ranchers, whose livelihoods depend upon normal and predictable weather, stand to lose the most from a changed climate, but also present a great opportunity to mitigate the impending disaster.

For America's farmers and ranchers, climate change is already here. Extreme weather events such as record high temperatures and drought are threatening crop productivity, stressing

water supplies, and increasing wildfire risks. At the same time, more frequent and intense storms wash away soil, prevent planting, and destroy entire crops. A changed climate also means new plant and animal diseases, increased pest pressure, and massive disruptions to traditional cropping systems. These impacts threaten our nation's food security and will require additional resources to overcome.

Although agriculture is currently a net source of greenhouse gasses (GHG), contributing approximately 10% of total US emissions, farmers and ranchers can be some of our nation's greatest allies in fighting climate change.[2] There are numerous cropland and grazing land "regenerative practices" that are known to remove CO_2 from the atmosphere by increasing the amount of carbon stored belowground in the soil. This process is called soil carbon sequestration, and it is an effective tool in mitigating climate change. Cover crops are one of the most proven and cost-effective of these regenerative practices.

The Benefits of Cover Crops

Climate Benefits

The CaRPE tool, which was developed by AFT in collaboration with USDA ARS, estimates that cover crops have the potential to reduce CO_2e emissions by a national average of 0.31 metric tons per acre, per year.[i, 3] In 2017, cover crops were planted on 15.4 million acres (about 6% of harvested annual cropland), reducing CO_2e emissions by approximately 5.5 million metric tons (MMT) in that year.[ii, 4, 5] If all harvested annual cropland acres in 2017 (approximately 256 million acres, or 65% of total cropland) were planted to cover crops, it could reduce CO_2e by 87 MMT annually.[6, 7] This annual reduction is equivalent to removing ***19 million passenger vehicles*** from the road for a year, or reducing 14% of agriculture's total GHG emissions.[8, 9] It should be noted that these estimated gains are from just one regenerative agricultural practice.

Economic benefits

In addition to the climate benefits, cover crops can also stabilize – or even increase – cash crop yields over time by improving soil health, limiting erosion and nutrient loss, controlling weeds, and maintaining soil moisture. For instance, a 2017 meta-analysis showed that, in certain conditions, winter cover crops could increase corn yield up to 33%.[10] Cover crops can also reduce the impacts of extreme weather on production, with farmers reporting yield increases in drought years, and earlier planting dates in wet years.[11] Certain cover crops also provide direct economic benefits to farmers when they are part of a "double cropping" system, where the so-called cover crop is harvested or grazed, rather than terminated. Finally, AFT's *Soil Health*

[i] This statistic assumes 50% legume and 50% non-legume cover crop adoption. Legume cover crops can reduce CO2e emissions by an average of 0.35 metric tons per acre per year, while non-legumes can reduce emissions by an average of 0.26 metric tons per acre per year. This data was generated using AFT's CaRPE Tool (https://farmland.org/carpetool/).

[ii] For the purposes of this paper, we provide percentages based on cover crops being implemented on harvested annual cropland according to the 2017 Census of Agriculture (defined by AFT as harvested cropland minus land in orchards and land in hay/forage production). In this example, we calculated 6% adoption by using 2017 acres of harvested annual cropland as the denominator.

Case Studies showed that when used as part of a suite of soil health practices, cover crops could increase yield and reduce costs associated with fertilizer and pesticides.[12] Given these many economic benefits, according to a USDA Sustainable Agriculture Research and Education (SARE) report, cover crops generally pay for themselves by year 3, and should produce a modest profit by year 5.[13]

Environmental Benefits

In addition to on-farm environmental benefits, cover crops also have off-farm environmental benefits.[14] Studies have shown that non-legume cover crops reduce nitrate leaching by an average of 56%, and can reduce phosphorus loss by up to 92%.[15, 16] While beneficial on a farm field, when these nutrients enter waterways they can cause toxic algae blooms and "dead zones" such as in the Gulf of Mexico. For this reason, many states have created cover crop incentive programs as a tool for improving water quality. In addition, cover crops provide habitat and resilient natural ecosystems for wildlife, including pollinators and other beneficial species.[17, 18, 19]

Barriers to Cover Crop Adoption

Despite their proven benefits, as of 2017, cover crops have only been adopted on 6% of harvested annual cropland, implying a large future opportunity.[20, 21] While adoption did increase by 50% between 2012 and 2017, this rate of gain is still not fast enough to adequately address our nation's climate and environmental challenges.[22] This is due to a number of different implementation barriers that include:

- **Technical barriers** – Since cover crops are a new practice for most farmers, they require additional knowledge, planning, and management to effectively implement. For instance, in addition to identifying the right varieties and seeding rates, farmers need to determine the right timing of planting and termination to ensure that the cover crops do not impact the harvest or seeding of the cash crop.[23, 24] Other technical barriers include access to appropriate equipment and seed.
- **Financial barriers** – Many farmers operate on tight margins, with little ability to spend money on practices that may not offer a large initial return on the investment. To implement cover crops, farmers must purchase the seed, cover the cost of termination, and potentially pay for additional labor and equipment. One survey found that the median combined cost of purchasing seed, planting, and terminating cover crops was $37 per acre, though this cost can vary based on many factors.[25]
- **Social barriers** – Research has suggested that farmers' willingness to adopt cover crops can be negatively impacted if their community views the practice as undesirable because it falls outside of what has "always been done."[26] In addition, any new practice comes with a degree of risk, both real and perceived.[27]

- **Structural barriers** – Although structural barriers to cover crops have decreased in recent years, they can still conflict with current state and federal policies. For instance, if farmers do not plant or terminate their cover crop by certain dates, it can negatively impact their crop insurance payment.[28]
- **Regional cropping system barriers** – Cover crop adoption can present extra challenges in certain climates and cropping systems, especially in cold areas with long-season annual crops. Additional support may be necessary to identify profitable cover crop management systems in these contexts.[29]

Despite these barriers, states have been successful at increasing cover crop adoption. For instance, a Maryland cost-share program has incentivized farmers to plant cover crops on 37% of its harvested annual cropland, over 6 times the national average.[30, 31] Other states, like Illinois and Iowa, have developed programs that give farmers a $5 rebate on crop insurance for each acre of cover crops. The Illinois "Fall Covers for Spring Savings" program has been highly successful, incentivizing farmers in 2020 to plant cover crops on 50,000 acres, including 35,000 acres of new adoption. This program demonstrates that even modest incentives can generate high demand. In its first year, the program was only able to enroll 45% of submitted acres.[32]

The Case for a Surge of Cover Crop Support

AFT believes that USDA can catalyze more widespread, long-term cover crop adoption by providing a 5-year surge of incentives and technical assistance. Why 5 years? First, we believe that 5 years is enough time for farmers to engage in the "trial and error" process sometimes necessary to determine how best to take advantage of the practice within their fields. Second, it can take as many as 5 years before the significant soil health improvements from cover crops become evident and begin paying dividends.[33] Third, we believe that a 5-year period of broader adoption can help to normalize the use of cover crops, thus leading to greater social acceptance of the practice such as what been experienced for no-till in certain farming regions.[34, 35]

The ultimate goal of a 5-year USDA Cover Crop Initiative would be to create the requisite level of attention, support, training, adoption, and normalization for the practice to be continued on its own merits long after the surge without the need to continue significant federal incentives.

RECOMMENDATIONS

AFT recommends the creation of a *USDA National Cover Crop Initiative* as a means of focusing the department's efforts on the goal of increasing cover crop adoption. This will require contributions from multiple agencies in both advancing incentives and removing barriers. Specifically, we encourage USDA to consider the following recommendations:

1. Establish a national goal for cover crop adoption.

A national goal can help to focus the department on outcomes and encourage better tracking of progress. In setting this goal, the department should strive to be both ambitious, yet realistic. If additional conservation funding were to be provided by the Congress, such a goal should be increased commensurately.

Recognizing that change does not take place overnight, one such goal could be to roughly triple the adoption of cover crops from the current 15.4 million acres to a total of 44.4 million acres (from 6% to 17.4% of harvested annual cropland acres). If this were achieved, approximately 14.5 MMT CO_2e could be reduced annually, equal to removing 3 million passenger vehicles from the road for a year.[36, 37]

2. Increase cover crop focus within EQIP and CSP.

NRCS programs like EQIP and CSP already provide support for cover crops and have served as an effective vehicle for encouraging their implementation. In recent years, both of these programs have increased their support of cover crops, with EQIP providing a larger share of its funding to the practice and CSP increasing payment rates as a result of the 2018 Farm Bill. This progress should be expanded upon, with producers potentially using a specialized "transition contract" for the length of five years. In promoting cover crop adoption, NRCS should review cover crop payment rates both in EQIP and CSP to evaluate if they are sufficient to encourage adoption and overcome perceived or actual income foregone during the transition. Furthermore, AFT recommends the inclusion of additional conservation funding as part of the Biden Administration's economic recovery and climate proposals to Congress.

3. Expand on-the-ground technical assistance for farmers.

The success of conservation programs like EQIP and CSP in rapidly delivering cover crop adoption is dependent upon adequate technical support. The combination of a hiring pause during the previous Administration, coupled with an aging workforce and other factors, has led to reduced NRCS staffing. While the agency was able to increase hiring in FY 2020, it still remains well below the 11,000 staff members recommended by its own analysis of need.[38] This has led to delays in providing vital on-the-ground technical support to farmers. AFT recommends that the Biden Administration continue providing NRCS with direct hiring authority and explore further steps to expedite hiring.

In addition to increasing staffing, NRCS must also strengthen outreach, education, and technical assistance. In doing so, the agency should prioritize individualized multi-year technical assistance for this transition period for producers. The agency should also look at ways to improve the Technical Service Provider (TSP) program as a part of this emphasis on technical assistance. In addition, NRCS must also meet new demand by capitalizing on, and expanding, its ability to work with third parties in providing essential technical support. Finally, NRCS

should take advantage of this hiring opportunity to further diversify technical service providers – especially by hiring Black, Indigenous, and People of Color (BIPOC) as well as women – to better support outreach to additional farming communities and non-operating landowners.

4. Conduct additional research into cover crop-related topics such as best practices, impacts, outreach, and market creation.

There is a need for more research from the National Institute of Food and Agriculture (NIFA) and the Agricultural Research Service (ARS) to further determine the benefits of regenerative practices, such as the amount of carbon sequestration from cover crops or their ability to increase the water holding capacity of soil. This research must be region-specific, and take into consideration factors such as weather, soil type, and cropping system. Standardized research protocols should be developed for determining rates of carbon sequestration, preferred soil sampling depth, timing, and methods so that studies can be better compared. AFT also recommends additional research designed to expand opportunities for double cropping to provide a market-based incentive for year-round cover.

5. Gather additional data and improve inter-agency information sharing on cover crop implementation and related results.

There is clear evidence that cover crops can reduce the risks to cash crops associated with extreme weather such as heavy precipitation events, drought, and high temperatures. Moreover, crop insurance rebate programs are demonstrably effective at incentivizing additional cover crop adoption. However, additional data must be gathered and assessed to enable the risk-reduction benefits to be more fully factored into crop insurance rates. There are a number of ways to improve data gathering. For instance, farmers could be required to certify their cover crop acreage through the FSA 578 reporting process, so there can be more accurate tracking of implementation. FSA should then share this certified cover crop data with RMA to strengthen their analysis of cover crop benefits and its relationship to crop insurance claims.

6. Study the role that crop insurance plays as a potential barrier to cover crop adoption.

Because of its widespread use, crop insurance plays a significant role in shaping decision-making in American agriculture. However, crop insurance can serve as a potential impediment to some conservation practice adoption and expansion. For instance, if farmers do not adhere to specific rules regarding cover crop termination dates, they can risk their insurance payment. While some of these rules have changed in recent years to provide greater flexibility for producers, more work must be done. To identify additional opportunities to harmonize the crop insurance system with cover crops, AFT recommends that a study be conducted on additional insurance barriers to adoption, and how such barriers can be effectively addressed.

American Farmland Trust is the only national organization that takes a holistic approach to agriculture, focusing on the land itself, the agricultural practices used on that land, and the farmers and ranchers who do the work. We look forward to serving as a resource to the Biden Administration. For more information about these and other recommendations, contact AFT Policy Director Tim Fink at tfink@farmland.org.

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