



American Society of Agronomy • Crop Science Society of America • Soil Science Society of America

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April 29, 2021

Mr. William Hohenstein
Director, Office of Energy and Environmental Policy
United States Department of Agriculture.
1400 Independence Avenue SW
Washington, DC 20250

Re: Tackling the Climate Crisis at Home and Abroad
Docket Number: USDA-2020-0003
Federal Register Effective Date: 03/16/2021
Federal Register Page Number: 14403-14404

Dear Mr. Hohenstein:

Thank you for the opportunity to offer comments to the U.S. Department of Agriculture (USDA) in response to President Biden's Executive Order on Tackling the Climate Crisis at Home and Abroad.

The American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and Soil Science Society of America (SSSA) represent more than 8,000 scientists in academia, industry, and government, 12,500 Certified Crop Advisers (CCA), and 781 Certified Professional Soil Scientists (CPSS). We are the largest coalition of professionals dedicated to the agronomy, crop and soil science disciplines in the United States. We are pleased to offer responses to USDA's questions that reflect the boots-on-the-ground realities facing producers as they endeavor to transition to climate-smart agricultural practices and the science and data that must be in place to make that transition successful.

[Encourage climate-smart agricultural practices now – three ideas for leveraging existing programs](#)

[Revise existing conservation programs with a point system to spur participation and innovation](#)

USDA can encourage voluntary adoption of climate-smart agricultural practices by leveraging existing programs. For example, the Conservation Reserve Program (CRP) or Environmental Quality Incentives Program (EQIP) could implement a point system encouraging producers to use climate-smart agricultural practices. Points could be awarded for practices with proven potential but could also be given in ways that encourage producers to take risks and see what works locally. The point system should be nationally implemented but locally appropriate, and U.S. regions with underrepresented cohorts of producers should be prioritized for the promotion of conservation programs that feature locally appropriate climate-smart agricultural practices. For example, areas in the southwestern United

States with Navajo and Hopi populations could have prioritized outreach for drought-related practices and climate-smart grazing.

To help develop climate-smart plans, USDA should encourage partnerships with Natural Resources Conservation Service (NRCS) employees, extension, and certified professionals as third-party service providers. These partnerships, with people producers trust, are the most direct way to encourage participation and innovation while providing actionable information.

Data collection from these projects is key, and USDA can incentivize and assist on-farm data collection. The more producers who consent to data sharing, the easier it is to anonymize the data, data that would unlock a wealth of information for local farm service agencies, watershed groups and irrigation districts, extension, and researchers, in addition to the producers themselves. Producers enrolled in this program whose practices realize ecological benefits could serve as demonstration farms for their neighbors, for example through “farm days” hosted by producers and organized with the help of USDA agencies. This is diversified innovation that captures local opportunities.

Develop transition programs for climate-smart agricultural practices like cover cropping

To encourage climate-smart agricultural practices with known benefits, such as cover or double-cropping, USDA could empower Farm Service Agency (FSA), Risk Management Agency (RMA), and NRCS to jointly develop a network of tools to simplify the adoption of cover or double-cropping systems. The program could start with a cloud-based cover crop support tool that is free, easy to use, nationally available, and locally specific. FSA offices can provide cloud access and technical support for the assessments. The technology and data exist to develop this tool, and additional data collected by researchers and producers alike would enable continuous improvement.

With this tool, a producer or crop adviser would input GPS (Global Positioning System) coordinates for the location of a field, and the tool would use publicly available soil, weather, and other data to give recommendations for optimized cover cropping systems. For example, based on historical trends and current precipitation, it could recommend which crops or species mixtures to plant, optimum seeding rates, and when to terminate cover crops. Further, if producers gave information about their current crops, inputs, and planting and harvest times, this tool would integrate information about water, carbon and other greenhouse gases, nitrogen and other nutrients, and livestock into its recommendations.

An essential feature of the tool will be the integration of long-term economic data for cover crop transitions to demonstrate a producer’s likely return on investment. For example, if a producer invested \$25 per acre each year, the tool should describe the expected direct financial and ecosystem services benefits over five, ten, or more years. Based on this economic information, USDA FSA should offer loans to producers to begin cover cropping using the tool’s recommendations. The loans could pay per acre for lost income for the first five years to promote implementation, and they should be structured to reflect income levels, with lower income operations qualifying for both loans and grants. After the transition period, the producer would be offered discounted crop insurance rates through RMA for the farm’s now less risky, more resilient system. So as not to disadvantage producers who have already made investments in cover crops, for farmers who already have a five-year or longer history of successful cover crop management experience, RMA should reduce insurance premiums to offset a portion of their investment.

Expand the Conservation Innovation Grants program

The 2018 Farm Bill authorized USDA's Conservation Innovation Grants program to include on-farm innovation trials that implement conservation practices on working lands. The program was conceived as a partnership between NRCS and private sector partners, who can receive a part of the \$25 million available annually to provide technical assistance and incentive payments to offset the risks and perceived risks to producers for trying new approaches. USDA should expand this program, focus on climate-smart agriculture practices, and specifically empower trusted, certified advisers, agricultural retailers, and extension to help producers develop climate-smart plans that qualify for the grants. The expansion should also include targets for including smaller and underrepresented producers.

Support emerging ecosystem services markets through fostering data collection and maintenance, stakeholder communication and collaborations, and national research programs

Verifying climate-smart agricultural practices requires ecosystem monitoring

To verify climate smart agricultural practices, scientists will need significant funding to coordinate a massive effort of research and data collection on agricultural ecosystem services. Researchers at institutions across the country are primed for this endeavor, and, indeed, some attempts have already been made. However, efforts have been hampered by the lack of the consistent, long-term funding that would lead to the reliable and comparable results needed to launch a nation-wide ecosystem services market. Short-term or partial funding enables the development of integrated teams, but with funding lasting only two to three years, those teams will have only just started when they disband, a massive waste of resources.

An efficient approach would be the expansion of USDA's Long-Term Agroecosystem Research (LTAR) Network, a partnership among 18 research sites currently focused on the sustainable intensification of agricultural production. These sites could easily be tapped to collect agricultural ecosystem services data over the long-term, but the 18 LTAR sites alone are not sufficient to gather enough information for a trusted, national ecosystem services marketplace. USDA should incorporate networked data from the LTARs with its Climate Hubs, a collection of ten regional centers that link USDA research to practitioners. Further, USDA must invite and include as many additional independent research institutions as possible, including state experiment stations and Agricultural Research Services (ARS) facilities.

State experiment stations will be especially useful as they often employ researchers with decades of experience collecting information from across their states. However, recent trends have diverted funding away from experiment station research, so to leverage these valuable resources, this trend must be reversed through an influx of research funding from USDA. Combined, these disparate, independent resources could serve as an ecosystem services monitoring network, feeding data into an integrated pipeline that would use artificial intelligence to deliver robust, accurate, and understandable tools to quantify agricultural ecosystem services.

It is important to note that sustainability is a moving target – there is no one solution that lasts forever. The practices that work today may be inappropriate or obsolete by tomorrow. Therefore, a long-term, well-maintained, dedicated system of ecosystem services monitoring is essential.

Invest in a fully-supported data repository

Just as crucial as sustained funding for data collection is the development and sustained maintenance of an agricultural data repository and a national, coordinated system to funnel observations into it. The repository should ascribe to FAIR (Findable, Accessible, Interoperable, Reusable) principles. Funding designated to set up the repository must also include tools for the training and incentivization of researchers and students to contribute organized and annotated data and meta-data. USDA should hire specialists to create data extraction and upload wizards for automatic extraction, standardized formatting, and depositing of data directly from research equipment, and these data specialists should work with equipment designers. USDA should also put considerable thought into data management, long-term sustainability, preservation and curation practices, and data privacy. New USDA programs that incentivize climate-smart agricultural practices should include a data collection component that feeds information into this data repository as a requirement for participation.

The data repository's success will be measured in its usefulness. Most data repositories currently available for agriculture data exists primarily as external hard drives, places to park data that are as useless as a laboratory notebook written in a foreign language. Great care must be taken for USDA's repository to avoid that fate. For it to achieve its potential, it needs to be amenable to independent researchers developing web tools for searches, analytics, and predictive modeling, for example through consistent file formats and an open-access structure. The data itself is invaluable, but the FAIR, open-access structure is what will drive scientific advancement.

Facilitate research programs to explore novel practices for ecosystem services enhancement

The private sector is clamoring for science-backed practices and products that facilitate the sequestration of carbon in soil and other ecosystem services. Researchers have found a great number of practices and products that show promise, but too many of these are effective only at a local or regional level. With this information alone, scientists are often uncomfortable making recommendations at a national level. An ecosystem services monitoring network and corresponding data repository, as described above, will go a long way to clarify when and where well-researched practices work, but this system will yield little data on less established practices.

For new ideas that show promise, USDA should facilitate the collaborations and investments necessary to form networked research programs that study a variety of locally appropriate cropping systems, such as agroforestry, and soil amendments, such as locally produced biochar, for carbon storage, water filtration, reduced erosion, and other ecosystem services. This research network should leverage ARS talent and facilities in conjunction with universities and research institutions to answer the pressing questions that limit private sector interest, such as when a practice is most effective where it makes most economic and environmental sense.

Support the communication necessary for successful ecosystem services markets

Emerging carbon and ecosystem services markets depend on evidence-based practices and testable outcomes. USDA can help establish these markets, first by facilitating communication among stakeholders, such as the academic scientists who verify practices, the certified professionals who recommend and test outcomes, the growers who produce the credits, and the companies that

ultimately buy them. This will help eliminate conflicting messaging, build trust, and ultimately encourage participation.

As new practices are verified by the research community, there needs to be rapid and continuous communication of new information and practices with those who can bring technical assistance directly to producers. One way to achieve this is for USDA to provide on-going opportunities for researchers to collaborate with NRCS employees, extension, ag retailers, and professional certifiants, such as Certified Crop Advisers (CCAs), to establish regional standards, metrics, and testing protocols for climate-smart agricultural practices and their effects. USDA should strive to engage in a meaningful dialogue with CCAs to identify and address emerging barriers and challenges and to strengthen this essential public-private partnership.

USDA should also serve as a clearinghouse for impartial information about ecosystem services markets, such as which options are available, what their requirements are, what kinds of payments are offered, if there are any risks, and other pro/cons necessary for informed decision-making.

Simplify Technical Service Provider certification to increase adoption of climate-smart practices

To scale up climate-smart agricultural practices, USDA needs to scale up technical assistance on the ground. NRCS field officers and extension both represent critical flows of technical information and assistance, but steady declines in funding mean that NRCS and extension are understaffed relative to need and are not able to visit and make recommendations for individual operations. At the same time, certified professionals, such as CCAs, are turning away from Technical Service Provider certification, which would expand USDA's reach, because the complex process is inhibitory, a fact underscored by its current underutilization.

Extension and certified professionals are already trusted resources that producers turn to for advice and assistance, and USDA should leverage these relationships to deliver technical assistance for climate-smart agricultural practices. To do this, USDA should simplify the process of Technical Service Provider certification and expand its use of cooperative agreements for non-federal partners, such as certified professionals. This would begin an all-hands-on-deck effort to provide landowners and producers with technical assistance, including best practices and market options, so that they can take advantage of the incredible investments in research and data collection being made.

Invest in AgARDA for bold, risky projects

A sustained, comprehensive ecosystem services monitoring network; a FAIR data repository alongside the tools and training that enable its success; and a nationwide biochar pilot production program are each bold but necessary investments in research and research infrastructure. Many more bold, risky, and large-scale projects are needed to support climate-smart agriculture as climate change continues to move the goalposts of sustainability, year after year. The Agriculture Advanced Research and Development Authority (AgARDA) was authorized in the 2018 Farm Bill for just this purpose.

AgARDA was conceived as an Advanced Research Projects Agency (ARPA) -style agency that would tackle the biggest challenges facing agriculture, many of which are climate related. As climate change moves the ranges of pests and pathogens, for example, traditional agriculture research would continue to

disburse funding for projects that deal with one pest on one crop in one place. This approach has proven reliable for years to maintain the status quo, but it will not be nearly enough to tackle the flood of climate-related pest issues that will soon arise. With this issue and many others, from droughts to salination of groundwater due to sea level rise, what is necessary is a systems-wide approach. AgARDA has the potential to spur researchers towards strategies, tools, and technologies with widespread, game-changing effect.

Support the science pipeline to increase diversity and environmental justice

To ensure that USDA programs apply environmental justice and address disadvantaged communities, USDA should support the science that underpins these programs and the scientists that come from communities most impacted by climate change. The graduate student cohort of the Agronomy, Crop, and Soil Science disciplines is the most diverse cross-section of our membership, and they have the potential to elevate issues like environmental justice, climate action, and equitable technical assistance through their scientific careers. Unfortunately, there are systemic barriers and inequities in place that discourage students of color from achieving their potential, resulting in a much less diverse cohort of professors leading our fields.

Current USDA programs for graduate students in the agricultural sciences are not sufficient to attract and retain talented and diverse students, especially those who come from disadvantaged backgrounds and are less likely to choose a field with weak and unreliable funding. USDA's Agriculture and Food Research Initiative's (AFRI) individual investigator grants may provide funding for student work, but their two to three-year duration is too short, the award amount too small, and the success rate too low to maintain graduate student interest and involvement. Agriculture departments lose good students, especially students without familial financial support networks, to other disciplines because they cannot guarantee reliable research positions.

USDA should double its budget for direct funding for graduate student research and programs from 1.5 to at least 3 percent of the USDA research budget. This funding would act as a magnet for talent and raise the profile of agricultural, food, and related industries. It would also raise the profile of underserved graduate students, who, with funding of their own, can choose research programs with goals that match their priorities. USDA should also expand its current educational programs, such as the Education and Workforce Development Initiative and National Needs Graduate and Postgraduate Fellowship program, and integrate them with USDA's 1890 National Scholars Program so that talented students at the 1890s Historically Black Colleges and Universities (HBCUs) and other minority serving institutions (MSIs) have a streamlined path towards fellowships in the agricultural sciences. Challenges these cohorts of students face should be assessed at each stage of advanced study to eliminate or mitigate roadblocks.

Charter an interagency committee empowered to make changes

The ASA, CSSA and SSSA applaud President Biden's all-hands-on-deck strategy to combat climate change and Secretary Vilsack's commitment to a climate-smart agriculture and forestry strategy at USDA. The recommendations we make in this comment represent ground-breaking opportunities, but many of these proposals would require integrated efforts from a variety of USDA agencies. We recommend that the Secretary charter an interagency committee with climate representatives from agencies and offices

empowered to speak for their agencies, set up new initiatives, make substantive changes to existing programs, and support new programs.