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The American Society of Agronomy (ASA), Crop Science Society of America (CSSA) and Soil Science Society of America (SSSA) represent nearly 8,000 scientists in academia, industry, and government. We also support a nationwide network of more than 13,300 Certified Crop Advisers (CCA) and over 700 Certified Professional Soil Scientists (CPSS) who work directly with farmers, many as technical service providers (TSPs). Our members and certified professionals are dedicated to meeting the demands of a growing world population through the pursuit and application of agronomic, crop and soil science knowledge.

In the past year, global challenges have pushed agricultural production systems past the tipping point of resiliency and threatened nutritional security. The 2023 Farm Bill can help America overcome these challenges and build resiliency for the future. This bill can prepare American agriculture for future threats to our food system by fostering growth, sparking innovation, and accelerating research translation. America's robust and diverse agricultural productivity stems from past Federal investments in agricultural science and technology research being translated to farmers through on-farm advisers and outreach specialists. Research investments have helped U.S. farmers through droughts and floods, pests, and pathogens, and changing consumer tastes while simultaneously promoting sustainability and soil health. They help provide Americans with safe, nutritious, and affordable food.

To maintain America's innovation and global competitiveness, we offer the following Farm Bill recommendations:

1. Provide robust, consistent, and diverse support for **agricultural research**
2. Improve coordination of **climate research** to enable translational research
3. Facilitate FAIR **data collection, sharing, storage, and reuse**
4. Support **equitable outcomes** in research, extension, education, and production
5. Leverage networks of trusted, **on-farm advisers** to meet technical assistance needs

Provide robust, consistent, and diverse support for agricultural research

The productivity and economic prosperity of American agriculture today builds on decades of investment in agricultural research and innovation. USDA's Economic Research Service (ERS) has noted that return on agricultural research investment is greater than 10:1. To build a resilient and equitable agricultural system for the future, we must not only maintain, but also grow the investment in USDA-sponsored research. The limited number of USDA research dollars is the primary known barrier to expanding public sector agricultural research and innovation across the U.S. Programmatic changes, including extending the lengths of grants to account for multi-year field studies and clarifying priority area definitions would allow USDA to better support and sustain long-term agricultural research, while still allowing for rapid research response to critical emerging issues. An across-the-board increase in

federal investment in agricultural research programs remains critical. Further, federal investments in foundational agricultural research will spur economic growth in the private sector.

Policy Ideas

- **Invest $5 billion for USDA's Research, Education, and Economics (REE) mission area** through mandatory and permanent baseline funding for existing research programs. Prioritize investments for research in fundamental processes in soil and plants and support for the next generation agricultural research workforce.
- **Foster innovation by reauthorizing the Agriculture Advanced Research and Development Authority (AGARDA)** to support cutting edge and high-risk projects.
- **Provide mandatory baseline funding for the Foundation for Food and Agriculture Research (FFAR).**
- **Support and expand long-term agricultural research through the Long-term Agricultural Research (LTAR) network and the Agricultural Experiment Stations.**
- **Expand funding opportunities for fundamental and applied soil science research** in USDA research programs.

Improve climate coordination to support translational research

As climate change exacerbates the pressures on agricultural producers to do even more with fewer inputs, while requiring agile production decisions in the face of changing environments, the pace of information exchange needs to quicken. To move into the future, collaborations among existing groups should be strengthened, and new, interdisciplinary, and multilevel alliances must be formed. This will accelerate translational research – information flow to and from the farm producers and on-farm advisers – and accelerate dissemination of best practices.

Policy Ideas

- **Establish a public-private consortium to accelerate research innovation and on-farm implementation at the interface of agriculture and climate.**
- **Create a National Center for Crop Improvement** to create crop cultivars and management recommendations needed to adapt U.S. agricultural systems to climate change.
- **Create an advisory board on climate-smart agriculture** to better prepare for, respond to, and communicate the impacts of climate change across stakeholder agencies and departments**.**
- **Expand on-farm research and demonstration efforts** through Cooperative Extension, Sustainable Agriculture Research and Education (SARE) program and Natural Resources Conservation Service (NRCS).
- **Increase support for and formalize the coordinating and educational role of USDA Climate Hubs** and support partnerships with climate centers across federal agencies**.**

Facilitate FAIR data collection, sharing, storage, and reuse

To achieve rapid gains in agricultural resilience, we need to address the roadblocks created by non-standardized data structures, long fostered by a research culture resistant to data sharing. The USDA must invest considerable planning and resources into what data are collected, managing that data and

then the long-term sustainability, preservation, and curation practices. While open data policies require researchers to make their federally funded data public, in many cases there is no federal repository or support to do so. Further, ensuring data privacy requires implementation of best practices, especially for farm families, workers, and farm business records. New USDA programs that incentivize climate-smart agricultural practices should include best practices for data curation that transfer data with their metadata into safe repositories to maintain data privacy. The repository should also ascribe to the FAIR (Findable, Accessible, Interoperable, Reusable) data standard accepted worldwide. Repository funding must also include tools to train and incentivize researchers and students to contribute organized and annotated data, and meta-data specialists for data extraction and upload applications.

Policy Ideas

- **Expand existing USDA data repositories.**
- **Create data stewardship and reporting standards for USDA-supported research.**
- **Support soil measuring and monitoring through the Cooperative Soil Survey and facilitate interdepartmental coordination on agricultural and environmental monitoring efforts.**
- **Establish recommended guidelines for measuring, verifying, and reporting on climate-smart agriculture practices.**
- **Fund science synthesis to translate research into evidence-based practices,** as is currently done in medicine where data are aggregated across studies using systematic reviews and meta-analysis.

Support equitable outcomes in research, extension, education, and production

ASA, CSSA, and SSSA have made the commitment to enhancing the experiences, opportunities, and safety of all Society members by creating a diverse, inclusive, and equitable environment in our scientific fields of study. USDA can play an invaluable role in addressing the equity challenges facing minority and underrepresented groups within the agricultural research workforce. Robust federal funding for the broad suite of USDA research programs can advance a more representative and equitable agricultural research enterprise by bolstering the student pipeline, expanding educational programs and grants - especially for minority-serving institutions (MSIs), expanding resources for early career researchers, and facilitating collaborations with diverse stakeholders to address existential threats, such as climate change. Further, we recognize that promoting equitable outcomes does not stop with the research workforce, but includes Extension, on-farm advisers, and farmers as well.

Policy Ideas

- **Urge the inclusion of minority-serving institutions (MSIs) in applications to become NIFA Centers of Excellence.**
- **Allocate funding to facilitate long-term partnerships between 1862, 1890, and 1994 land-grant universities** that enable student and faculty exchanges and shared facilities and research services.
- **Broaden interagency support for agricultural research and extension infrastructure at MSIs and non-land grant institutions through regional agricultural science innovation engines.**
- **Expand scholarship funding for students from underrepresented backgrounds.**

- **Allow students to apply for NIFA graduate fellowships earlier and to transfer funding upon graduation.**
- **Improve accessibility of Farm Bill conservation programs to better serve minority, beginning, small, Veteran, and disadvantaged farmers, and urban populations.**

Leverage networks of trusted, on-farm advisers to meet technical assistance needs

Cooperative Extension and USDA's Natural Resource Conservation Service (NRCS) employees work along with certified professional advisers, such as Certified Crop Advisors (CCAs), to bring the latest techniques and technologies to producers. 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. At the same time when technical assistance is in high demand, the Cooperative Extension system is plagued with outdated infrastructure, reduced budgets, and limited personnel. Certified professionals struggle to navigate the cumbersome and complex process to gain Technical Service Provider (TSP) certification. Further, USDA must facilitate combined training for NRCS staff, TSPs, Cooperative Extension specialists, and CCAs so that all technical advisers are providing farmers with consistent messaging. To deliver state-of-the-art, timely assistance to producers and help them navigate production challenges and conservation opportunities, USDA needs to support an all-hands-on-deck approach among on-farm advisers.

Policy Ideas

- **Significantly invest in the Cooperative Extension System personnel, technology, and facilities.**
- **Improve the NRCS Technical Service Provider (TSP) program** to allow more trusted advisers to provide technical assistance to producers**.**
- **Require and support communication and outreach training for all stakeholders in USDA initiatives.**
- **Promote public access to USDA-funded research findings and weather station data** to improve access for on-farm advisers**.**
- **Invest in the agricultural and conservation workforce** by supporting K-12 and collegiate education opportunities.
- **Create a technical assistance mentorship program** to promote workforce expansion**.**