Pursuing a Unifying Message

Elevating Food, Agricultural and Natural Resources Research as a National Priority

A Natural Resources Research Perspective

Charles Valentine Riley Memorial Foundation

IOWA STATE UNIVERSITY

SoAR FOUNDATION

NATIONAL SUSTAINABLE AGRICULTURE COALITION

SOIL AND WATER CONSERVATION SOCIETY

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National Sustainable Agriculture Coalition

and

Soil and Water Conservation Society

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The Charles Valentine Riley Memorial Foundation is committed to promoting a broader and more complete understanding of agriculture and to building upon Charles Valentine Riley's legacy as a "whole picture" person with a vision for enhancing agriculture through scientific knowledge.

Editors
Tim Fink, Supporters of Agricultural Research (SoAR) Foundation,
Brian Meyer, Iowa State University, and
Richard Ridgway, Charles Valentine Riley Memorial Foundation

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The Charles Valentine Riley Memorial Foundation (RMF) thanks the American Association for the Advancement of Science (AAAS) for hosting the natural resources research roundtable on December 15, 2016. Special thanks to Joanne Carney, Director of Government Relations for AAAS for providing the welcome and opening the day's program. We are grateful, too, for the support of the AAAS staff, who helped to ensure the event proceeded smoothly.

We appreciate the support, guidance and organization provided by the roundtable's co-convening organizations: the Soil and Water Conservation Society, National Sustainable Agriculture Coalition, Supporters of Agricultural Research, Iowa State University, the Tri Societies of the American Society of Agronomy, the Crop Science Society of America and the Soil Science Society of America, and the Soil Health Institute.

We thank each of the 22 participants at the roundtable. We appreciated their valuable perspectives on natural resources and how they fit with the idea of a unifying message to raise the federal priority for food, agricultural and natural resources research. We also welcomed observers from five different organizations.

Special thanks to the five presenters who helped set the stage for the discussion: Greg Bohach of Mississippi State University, Steven Shafer of the Soil Health Institute, Ronald Turco of Purdue University, John Barnwell of the Society of American Foresters, and Marlen Eve of the USDA Agricultural Research Service.

Thank you to the co-chairs of the roundtable, Jim Gulliford and Ferd Hoefner, for their tremendous leadership in bringing this discussion to fruition. The members of the roundtable steering committee are listed on the next page; we thank them for their service and commitment.

Finally, we thank Pat Field of the Consensus Building Institute for facilitating our roundtable discussion, and laying the foundation for this report. Tim Fink of the Supporters of Agricultural Research (SoAR) Foundation served as editor, with valuable contributions from Richard Ridgway, president emeritus of RMF, and Brian Meyer of Iowa State University. Our appreciation also goes to Susan Thompson and Brian Meyer of Iowa State University for their efforts in finalizing the report.

Steering Committee

Jim Gulliford (Co-chair), Executive Director, Soil and Water Conservation Society

Ferd Hoefner (Co-chair), Policy Director, National Sustainable Agriculture Coalition

Patrick Field (Facilitator), Managing Director, Consensus Building Institute

Karl Anderson, Director of Government Relations, American Society of Agronomy, Soil Science Society of America and Crop Science Society of America

John Barnwell, Director, Government and External Affairs, Society of American Foresters

Tim Fink, Director of Research and Policy Analysis, Supporters of Agricultural Research

Brian Meyer, Director of College Relations, College of Agriculture and Life Sciences, Iowa State University

Richard Ridgway, USDA-ARS (retired); RMF President Emeritus; RMF Task Force, Steering Committee

Steven Shafer, Chief Scientific Officer, Soil Health Institute

Julie Sibbing, Senior Director, Agriculture and Forestry Programs, National Wildlife Federation

Carol Werner, Executive Director, Environmental and Energy Study Institute

Highlights

On December 15, 2016, a group representing more than 20 organizations gathered at the American Association for the Advancement of Science headquarters to discuss a unifying message to elevate food, agricultural and natural resources research as a national priority. Remarks centered on natural resources research as the foundation for a resilient agricultural system. Highlights from the roundtable discussion are below.

- **Addressing threats.** Increased investment in agriculture research is needed, both generally, and for natural resource and environmental research in particular, to address threats such as excessive nutrients and water quality, diseases, invasive species and climate change.

- **Tailor the message.** We have a great story to tell — creative and innovative research, thousands of scientists around the country working to solve problems, stakeholders who are invested in our research, and numerous data, scientific findings and learning. But that's not the story elected officials want to hear. Instead, we must talk about impact, the return on public investment for economies, communities and natural resources. The message must be tailored to the audience, not to ourselves.

- **Build on past success.** We have experience and success to build on. We have leveraged existing assets; encouraged competition; linked economic need to research; created clear connections between funding, the funders and the research; and secured funding with big, bold ideas.

- **Serious challenges ahead.** There are real challenges to increasing agriculture and natural resource research funding. Research is only one of many core missions of USDA and often not our stakeholders' first priority. Agriculture research is disaggregated and diverse, and historically has been structured discipline-by-discipline. Much agricultural research has become associated in the public's mind with large-scale agriculture, and thus, concerns about natural resources and environmental impact.

- **Creating the message.** There are key, core components of a unified message. It has to be personal. It has to address economics, health and quality of life. It has to consider sustainability, renewability and resilience. Clean water and air and healthy wildlife matter. Connection and integration across disciplines is essential in tackling today's complex problems. Research is about transformation and innovation. Co-benefits are important. Research is a public good and, in some important ways, creates the "goods" of the future.

Introduction and Background

The natural resources roundtable was the sixth event in the effort to pursue a unifying message on food, agriculture and natural resource research, organized by the Charles Valentine Riley Memorial Foundation (RMF) and its partners. The first event, held at the National Press Club in December 2014, provided the foundation for subsequent stakeholder events that would contribute to elevating agricultural research as a national priority. Agriculture is broadly defined in the efforts to include food, fiber, nutrition, energy, natural resources, environmental quality and more.

The sixth and final event in the series, hosted by the American Association for the Advancement of Science (AAAS), was held in December 2016 with a set of leaders from natural resource and environmental non-governmental organizations (NGOs), natural resource societies and universities. It focused on a unifying message with the perspective of natural resource and environmental quality. The roundtable was organized and this report prepared with the assistance of a steering committee composed of representatives from the Alliance of Crop, Soil and Environmental Science Societies, Society of American Foresters, Supporters of Agricultural Research Foundation, National Sustainable Agriculture Coalition, Iowa State University, Soil Health Institute, National Wildlife Federation, Environmental and Energy Study Institute, Soil and Water Conservation Society, and the Charles Valentine Riley Memorial Foundation.

Joanne Carney of AAAS opened the roundtable, and emphasized the importance of this effort for advancing science. She stressed underinvesting and neglecting key research areas can undermine scientific domains, not just year-to-year, but in the longer-term as well.

Wendy Wintersteen, dean of the College of Agriculture and Life Sciences at Iowa State University and president of the RMF board of directors, emphasized the need for increased investment in agriculture research generally, and in particular for natural resource and environmental research to address threats including excessive nutrients and water quality, diseases, invasive species and climate change. She emphasized RMF's desire to support the agricultural research community and its users to develop a unified message that would focus on growing the "pie" for all, rather than focusing on allocating scarce research dollars among issues and actors. Twenty years from now she hopes the public thanks this community for having the foresight and initiative to grow funding, rather than asks why we failed to prepare for the imminent threats facing agriculture systems.

"Will we rally around a common goal to address this country's and global challenges, or retrench to our narrower and parochial views, letting research investment stay flat or even dwindle?"

Greg Bohach, vice president of the Mississippi State University Division of Agriculture, Forestry, and Veterinary Medicine, and chair of the Association of Public and Land Grant Universities' Committee on Legislation and Policy, provided an overview of the work they are doing to prepare for the next Farm Bill. This committee is part of the Board of Agricultural Assembly (BAA) that is in turn one of five boards of the Commission on Food, Environment and Renewable Resources. Bohach said they conducted extensive outreach to members and identified about 160 initial recommendations. In October 2016, the committee met to review, combine and prioritize these recommendations, narrowing the list to 48. Participants in these conversations noted it has been difficult to move from authorizations to actual appropriated dollars; building and committing to partnerships and a range of funding sources is important; and the needs for research programs and facility infrastructure can only be funded through strong, unified support to ensure U.S. excellence.

Four presenters set the stage for discussion among the full group. They were Steven Shafer, Soil Health Institute; Ronald Turco, Purdue University; John Barnwell, Society of American Foresters; and Marlen Eve, USDA's Agricultural Research Service (ARS).

Steven Shafer presented on soil research. He said soil health is the capacity of a soil to function as a vital, living ecosystem to sustain plants, animals and humans. Soil health integrates many aspects of soil science, including biological, chemical and physical.

"We have a good story to tell…But that's not the story elected officials care about. We must talk about impact, the return on public investment for economies, communities and natural resources."

Schafer said there are significant challenges — growing food to produce as many calories in the 21st century as was done in all previous centuries, in the midst of rising temperatures and drought due to climate change, and with three-fourths of freshwater resources estimated to be in no better than fair condition, with nutrients as a major water quality problem.

There is a good story to tell — creative and innovative research, thousands of soil scientists and related experts around the country working to solve problems, stakeholders who are invested in research, and numerous data, scientific findings and learning. But that's not the story elected officials care most about. The story must be about impact, the return on public investment for economies, communities and natural resources.

If this message is to resonate with elected officials, Schafer said it shouldn't be about increasing water-holding capacity through proper soil management. Rather, it should be about the dollar value of the water per acre retained, or its impact on productivity. It should be about the value of the increased yield during drought due to cover cropping. It should be about the dollar value of nutrients retained on the farm, and the cost avoided in nutrient cleanup for watersheds. In short, the message must be tailored to the audience of appropriators, not to ourselves.

Ronald Turco, Purdue University, presented on water. He said photosynthesis is primarily based on solar energy input and water — water becomes the plant — and noted water and soil health are inextricably linked.

Agriculture depends on green water from precipitation, blue water from irrigation, and, in some cases, gray water from treated wastewater. New water is not being produced and the cost of desalination to create freshwater is not economically feasible except for residential use, and only in some limited circumstances.

"At the current rate of water use and population growth, we are on a collision course between need and supply."

Around the world, Turco said we still rely primarily on green water or precipitation. Sixty percent of the world's agriculture is rain-fed, yet the 40 percent of blue water, or irrigated agricultural production, consumes some 75 percent of the world's freshwater resources. In the United States, for the most part, there is an east and west divide between precipitation-fed and irrigated agriculture. At the current rate of water use and population growth, we are on a collision course between need and supply.

Turco said since the future of water is unclear, research needs include developing realistic expectations of supply; realistic expectations of potential uses; proper valuation of the tie between soil and water; importance of soil in the agricultural water cycle; protection and management of groundwater resources; and better understanding of management of both rain-fed and irrigated water.

John Barnwell, Society of American Foresters, presented on forestry research. He said forestry faces the challenge of being considered different from other agricultural crops. Like many other specialty programs, forestry is losing both research dollars and general support. The old ways of organizing and funding are not working.

He said forestry research faces a significant downward trend in private as well as public sector funding. It is harder to fund the legacy programs that feed into so much other research. The focus must be on key messages

such as forests as "original infrastructure" and as key to soil health, water quality, and habitat for important species like threatened bats.

Barnwell said as there is a move away from large commercial forests, the focus needs to shift to small lot holders and link to beginning and small farmer and rancher programs. However, it is difficult to get such disaggregated users to strongly support research funding. It's also important to identify regional interests and research, and find regional stakeholders who can support programs, because they see direct value.

Marlen Eve, USDA ARS, presented on climate research. He said ARS addresses climate on both mitigation and adaptation, does this under its Natural Resources and Sustainable Agricultural Systems work, and treats climate as a cross-cutting issue.

He said the message has shifted from research to understand climate change, to the fact the climate has changed, how to deal with it and how to provide food, fiber and fuel in the face of this change, as well as increasing demand.

"The combination of flat funding and increased costs is leading to less research."

ARS fosters cross-location and coordination research and data collection through such research networks as GRACEnet (Greenhouse gas Reduction through Agricultural Carbon Enhancement), programs such as REAP (Resilient Economic Agricultural Practices), the Dairy Agroecosystem Working Group, and other emerging working groups.

ARS also is interested in biomass as energy, while maintaining soil health, climate change impacts like post-fire wind erosion in the Great Basin, soil biology and antibiotics.

Eve said USDA's building blocks for adaptation under Climate Smart Agriculture and Forestry include nitrogen stewardship, livestock partnerships, urban forest and other programs. Lastly, USDA is establishing regional climate hubs to provide information and tools to land managers to build resilience to climate variability, while also trying to form partnerships and work efficiently.

Discussion

Following is a summary of key points and comments from the discussions.

Past successes support the request for increased research funding.

Participants identified a number of past successes increasing agriculture and natural resource funding, which revealed key lessons to draw from in raising awareness and advocacy for future funding.

Leverage existing assets. USDA's Long-Term Agroecosystem Research (LTAR) network received funding because it made the case it was leveraging existing assets, including long-term watershed and rangeland research sites and existing infrastructure. The angle of "this exists, let's take advantage of it" played well.

Encourage competition. Competitive grant programs have grown because a broad swath of stakeholders see they have a shot at getting funding, Congress likes the idea of competition, and it builds broader support.

Link economic need to research. In 2000, renewable energy was offered as a means to address very real and immediate economic issues in the farming community. This led to the first-ever energy title in the Farm Bill. The tighter research agendas can be linked to timely economic issues, the better.

Create a clear nexus between funding, the funders and the research. While more typical at the state level, excise taxes on hunting licenses, arms and ammunition help tie fees directly to users and their interests. States use these monies to fund wildlife research that benefits the natural resource, key users and the stewards of the resource. When stakeholders can see direct benefit, they are more likely to support funding.

Big ideas sell. Many years ago, corn growers set the goal of mapping the corn genome. This led to excitement, funding and significant research. Big, audacious goals can draw funding.

> *"It is not enough to simply ask for more funding. We must provide policymakers with a clear and bold vision for how these additional resources will be used. We need a 'moonshot moment.'"*

Serious challenges to increasing agriculture and natural resource research funding.

Participants identified a number of challenges to increasing agriculture and natural resource research funding.

Enlarging the sliver of research in USDA budget. Mandatory funding on a wide set of large programs and high priorities takes up the majority of the USDA's annual budget. Funding of agricultural research — harnessed to many practical, economic and rural concerns — lies within the agency's much smaller pool of discretionary funding, amounting to less than one-percent of the total USDA budget.

Research is not our stakeholders' first priority. While stakeholders including the natural resource and environmental community, farmers and agribusiness care about natural resource research, it falls far down their priority list, thus not getting the attention and support needed to sustain and grow it.

Agriculture research is disaggregated and diverse. Even within natural resource agricultural research, interests range from water to soil to wildlife and from nutrient management to wildfire management. It's difficult to build a coalition of such disparate interests.

"It can't just be scientists telling the story. We need more farmers and other users saying: 'Without this particular research, we'd be sunk.'"

Agricultural research has historically been structured by discipline. The aging structure of research is by discipline – soil science, forestry, entomology, etc. – but the public and funders are interested in cross-disciplinary research to solve big problems like water degradation, obesity and climate.

Research as "big ag." Much agricultural research has become associated with large-scale agriculture and concerns, deserved or not, around production agriculture issues such as genetically modified organisms or natural resource issues such as soil and water quality degradation. Thus, the public may not actively support agriculture research because they see it beholden to large, powerful business concerns and not their own interests. Significant industry research spending also has led to the perception among others in the public that private industry is already addressing most research needs. However, there are many research needs unlikely to be addressed by the private sector. Partnerships between the private and public sector can address problems unlikely to be addressed by the private sector alone.

Components of a unified message.

Through both individual work and group discussion, participants identified a number of possible key components to a unified message. These components and a brief description of each are below.

Personal. The public needs to understand how agricultural research benefits them personally. It's how investment impacts the things they care most about — healthy food and environmental quality.

"Ag research's message has so often been disconnected from the consumer. Everyone knows someone impacted by cancer. We need to find similar ways of resonating with people's deepest values and concerns."

Economics. In this climate of deep unease about the American dream, economic issues and concerns, especially for rural communities, are in the forefront of everyone's minds. Research, as much as researchers value it for its own good, must show a positive economic return. We must show how agricultural research affects the average American's wallet.

Health. People care more and more about their health – what they eat, if their food is safe, and how their food is healthy (or not) due to nutrients, calories, residues, etc. We must show agricultural research supports good nutrition, and good nutrition is the basis of good health.

Sustainable, Renewable, Resilient. While different audiences may receive these words differently, the notion of research that ensures long-term sustainability, increases renewable energy resources, and increases resilience in the face of change, is powerful.

Clean Water and Air, Healthy Wildlife. The public may disagree about regulation and the exact role of government, but they strongly support research that helps ensure clean water, air, and healthy wildlife populations. Conserving and improving natural resources provides ecosystem services that in turn benefit human activities and wellbeing.

Connection and Integration. The public is less interested in narrow disciplines, and far more interested in the connection between ideas, problems, and solutions across issues of soil, water, animal agriculture, wildlife and climate.

Transformation and Innovation. Research needs to be about big ideas, not narrow, arcane subjects. The public and policymakers are more likely to be moved by bold, exciting goals, transformational ideas, and the excitement and appeal of the new.

Co-benefits. Break out of the "single benefit or outcome" thinking and demonstrate impact across a host of benefits and beneficiaries.

The Future. Investment in research is an investment in the future to help feed a growing population, increasing food security in the face of change, preserving global competitiveness, and preparing for future threats not yet identified.

Public Good. Research needs to be seen as a public good, especially with the declining research dollars by the public sector. Therefore, the research agenda must be a public interest agenda.

Potential strategies to pursue.

Participants identified several strategies that might be considered in developing and disseminating a unified message. They discussed an overarching goal or vision that might galvanize diverse agricultural interests, the public and funders. All agreed a powerful goal, either in the total dollar increase request, or under a broad theme, would be galvanizing. However, what that goal or vision might be is not certain, nor is it certain one could be broadly agreed upon.

"The unifying message should include the benefit to the constituent on the street who can influence Congress."

- Some argued for a goal of transforming the food system for local economic return, increased economic and farming opportunity, healthier farming and eating, and a different way of creating and interacting with our food supply. After all, we are faced with big questions — given a changing climate, an increasing population, and stressed natural resources, are we growing the right crops in the right places with the right techniques? Research should be in the service of that transformative goal.
- Others cautioned such a goal would likely turn away key interests, though "transformation" in general use could mean many things to many people.
- Some participants stressed the need for inclusion of a broad range of allies to ensure sufficient support. They noted everyone needs to see themselves in the message for it to be effective.

In addition, participants named the following possible strategies or approaches.

- The current political climate suggests the need to focus not on global food and agriculture issues, but on issues most pertinent to the United States and its competitive standing (or lack thereof) to the rest of the world.
- Messages need to meet current trends, priorities and context. We cannot be tone deaf to the current broader "zeitgeist."
- Compelling research must be showcased and compelling anecdotes told.
- Help is needed to shift the notion of "public research" to "partnership research" among many sectors.
- We cannot keep saying the United States has the "safest, most affordable and most abundant" food supply. That tried and tired message reinforces the idea that all is well in agriculture. Without changing the message, there will be a time when that is no longer factual.

Messaging the future.

Participants brainstormed a key message or "pitch" that might resonate. Ideas are listed below.

"Rather than continuing to fight over how to divide up a shrinking pie, we need to fight for a bigger pie."

- It's the economy. Investment in agricultural research spurs innovation, builds new businesses and creates new jobs. Give us $7 billion — we'll generate $50 billion in return.

- Lack of investment in agricultural science is hazardous to your health — we won't have enough food, be prepared for new diseases, or have the quality of water and soil needed.
- We need to feed 9 billion people by 2050 without damaging the air, water, soil or climate. Agricultural research is essential to save the future.
- Investment in agricultural research is investment in rural communities, the food we eat, national security, American products, and the health of the nation.
- What's the best investment you can make to reverberate across, and tie together, rural and urban America? Agriculture research for a nutritious and safe food supply, clean water and air, and thriving communities.
- Preserve the future. The past has taught us civilizations fail when they degrade land, water, and soil – the base upon which their prosperity is built. Let's feed more people with less impact, save the future, and avoid the inevitable path to failure.

A unifying message is worth pursuing.

At the end of the day, participants were asked if a unifying message was worth pursuing and if they would "put a shoulder" to advancing that message. Under the right conditions, with the right message, participants wholeheartedly concluded an effective unifying message is worth pursuing.

Participants

Karl Anderson, Director of Government Relations, American Society of Agronomy, Soil Science Society of America and Crop Science Society of America

John Barnwell, Director, Government and External Affairs, Society of American Foresters (presenter)

Greg Bohach, Vice President, Division of Agriculture, Forestry and Veterinary Medicine, Mississippi State University (presenter)

Joanne Carney, Director, Office of Government Relations, American Association for the Advancement of Science (presenter)

Warren Conway, Bricker Endowed Chair in Wildlife Management, Texas Tech University

Jimmy Daukas, Senior Program Officer, American Farmland Trust

Marlen Eve, National Program Leader: Soil and Air, USDA Agricultural Research Service (presenter)

Tim Fink, Director of Research and Policy Analysis, Supporters of Agricultural Research

Caron Gala, Executive Director, Council on Food, Agricultural and Resource Economics

Tom Grumbly, President, Supporters of Agricultural Research (presenter)

Jim Gulliford, Executive Director, Soil and Water Conservation Society

Chris Heck, Government Affairs Associate, National Association of Conservation Districts

Ferd Hoefner, Policy Director, National Sustainable Agriculture Coalition

Diana Jerkins, Research Program Director, Organic Farming Research Foundation

Glynis Lough, Deputy Director and Research Director, Food and Environment, Union of Concerned Scientists

Eileen McLellan, Lead Senior Scientist, Environmental Defense Fund

Jess Peterson, Executive Vice President, Society for Range Management

Carlos Rodriguez-Franco, Deputy Chief, USDA Forest Service

Steven Shafer, Chief Scientific Officer, Soil Health Institute (presenter)

Ronald Turco, Professor, Environmental Microbiology – Agronomy, and Assistant Dean for Agricultural and Environmental Research, Purdue University (presenter)

Carol Werner, Executive Director, Environmental and Energy Study Institute

Wendy Wintersteen, Endowed Dean, College of Agriculture and Life Sciences, Iowa State University (presenter)

Observers

Andrew Manale, Senior Policy Analyst, U.S. Environmental Protection Agency (retired)

Brian Meyer, Director of College Relations, College of Agriculture and Life Sciences, Iowa State University

Michael Stein, Policy Associate, Organic Farming Research Foundation

Trevor White, Combest, Sell and Associates

Caren Wilcox, Special Assistant to the Under Secretary, USDA Research, Education and Economics (retired)

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