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Issue Report

Understanding the Priorities, Focuses and Potential Implications of Conservation Agriculture

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Farm Foundation

About this Issue Report

This Farm Foundation Issue Report seeks to examine the increasing motivation and pressure across the United States to expand and further develop conservation practices within agriculture. Conservation agriculture is an evolving issue, and the benefits and implications of new agricultural practices will be explored.

The future of the planet and its inhabitants is inherently dependent on the success of agriculture. The world's population is projected to reach over 9 billion by the year 2050. With this population surge, the demand for food, fiber and fuel will continue to exponentially increase. It follows that the strain on natural resources will continue to increase as well. In order to sustain the possibility of a prosperous and healthy planet in the next century, we depend on the continued environmental and economic viability of farming.

Agriculture in the United States is deeply intertwined with the natural resources of the country. Croplands and natural lands intersect in numerous ways and these intersections demand a closer evaluation of the environmental and economic capacities of conservation agriculture. Farmers across the country use best management practices, when available, to safeguard these natural resources. Additionally, federal and state governments and non-governmental organizations (NGOs) may lend support to those growers. Having a developed understanding of some of these conversation practices, as well as the priorities farmers, governments and NGOs place upon them, can lead to productive discussions around conservation agriculture.

Benefits of Conservation

There is enormous potential for agriculture to have positive and lasting environmental impacts across the globe. According to the U.S. Department of Agriculture (USDA), the total land in agricultural production in the United States hovers at just more than 40 percent.¹ Erosion, erratic weather events, water shortages, pollution and declining biodiversity are all threats to the agricultural industry, food security and our natural resources. Farmers have the opportunity to commit to practices that not only combat these threats, but that provide benefits to the environment and increase production and economic yields as well.

The Food and Agriculture Organization of the United Nations (FAO) defines the three main principles of “conservation agriculture” as minimum mechanical soil disturbance, permanent soil organic cover and species diversification.² Each of these conservation practices enhances the natural biological processes associated with farming, improves nutrient and

water use efficiency and has the potential to increase crop production. Some farmers engage in these conservation practices on their own; others rely on support from governments and NGOs to assist with the adoption of these practices.

Federal Support for Conservation

Currently, there are about two dozen agricultural conservation programs funded by the federal government. These programs provide support and resources, both financially and technically, to farmers who wish to engage in conservation agriculture. These programs are typically administered by USDA’s Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA). The programs can be generally grouped into five categories: Working lands programs, land retirement and easement programs, technical assistance programs, watershed programs and emergency programs.^{6,7}

Figure 1 – Overview of conservation practices.^{3,4,5}

Conservation Practice	Benefits	Challenges
Minimum Mechanical Soil Disturbance	Provides excellent erosion control. Soil moisture and health is maintained. Minimizes fuel and labor costs associated with tillage.	Increases dependency on herbicides. Makes soil warming more difficult in poorly drained soils. Little to no crop residue incorporation occurs.
Permanent Soil Organic Cover	Provides excellent erosion control. Increases soil health. Can lead to long-term increases in soil organic matter. Increases carbon sequestration.	Requires additional labor and capital. May increase pest populations.
Species Diversification	Improves soil health and production due to crops having different rooting patterns. Soil nutrients and water are used more efficiently. Decreases risk of pest infestation.	More planning is necessary for crop diversification. Start-up costs for species diversification can be high.

Figure 2 – Overview of federal conservation programs

Program Type	Description	Conservation Programs Included
Working Lands Programs	<p>Programs that allow private land to remain in production, while implementing a variety of conservation practices. These practices are designed to address natural resource concerns specific to the area.</p>	<p>Agricultural Management Assistance (AMA), Conservation Stewardship Program (CSP), Environmental Quality Incentives Program (EQIP), Regional Conservation Partnership Program (RCPP)</p>
Land Retirement and Easement Programs	<p>Land retirement programs make federal payments to private agricultural landowners for temporary changes in land use or management to achieve environmental benefits. Conservation easements exchange federal payments for a voluntary and permanent land use restriction.</p>	<p>Agricultural Conservation Easement Program (ACEP), Conservation Reserve Program (CRP), Healthy Forests Reserve Program (HFRP)</p>
Technical Assistance Programs	<p>Programs that provide landowners with science-based conservation information and technical expertise. This information is typically unique to the region and land use type. Financial assistance is not usually provided for technical assistance programs.</p>	<p>Conservation Technical Assistance (CTA)</p>
Watershed Programs	<p>Programs designed to carry out activities for soil conservation; flood prevention; conservation, development, utilization, and disposal of water; watershed surveys; and dam rehabilitation.</p>	<p>Watershed and Flood Prevention Operations, Watershed Rehabilitation Program</p>
Emergency Programs	<p>Programs that provide disaster assistance for farmland rehabilitation and destruction to watersheds.</p>	<p>Emergency Conservation Program (ECP), Emergency Forest Restoration Program (EFRP), Emergency Watershed Protection (EWP)</p>

Although the apparent scope of these programs is large, only about 22 percent of applicants receive federal funding for CRP and around 29 percent of applicants receive federal funding for EQIP.⁸ The 2018 Farm Bill is projected to spend about \$60 billion on conservation, which maintains a \$6 million cut to conservation funding that occurred in the 2014 Farm Bill.⁹

While federal funding for conservation agriculture does exist, it is not nearly enough to provide financial assistance to all farmers interested in conservation programs. Incentivization for agricultural conservation cannot be solely dependent on the existence of federal funding. In order to implement more widespread adoption of agricultural conservation practices, farmers may need additional financial incentives and technical support.

Efforts of Conservation Organizations

There are several organizations that work towards promoting the adoption of agricultural conservation practices. Their efforts augment the programs offered by the federal government through NRCS and FSA. The work of these organizations includes advocating for federal and state conservation policies, acquiring land, initiating discussions and conducting research.

Additionally, they may supply economic and technical support for farmers. The scope of conservation agriculture is large, and there is a multitude of practices that fall under the umbrella of “sustainable farming.” It can be challenging to keep track of which conservation practices fit into which areas. In addition, the focus of each organization varies slightly, but the overarching intent to protect both natural and working lands for the foreseeable future is consistent.

Figure 3 – Conservation practices by category

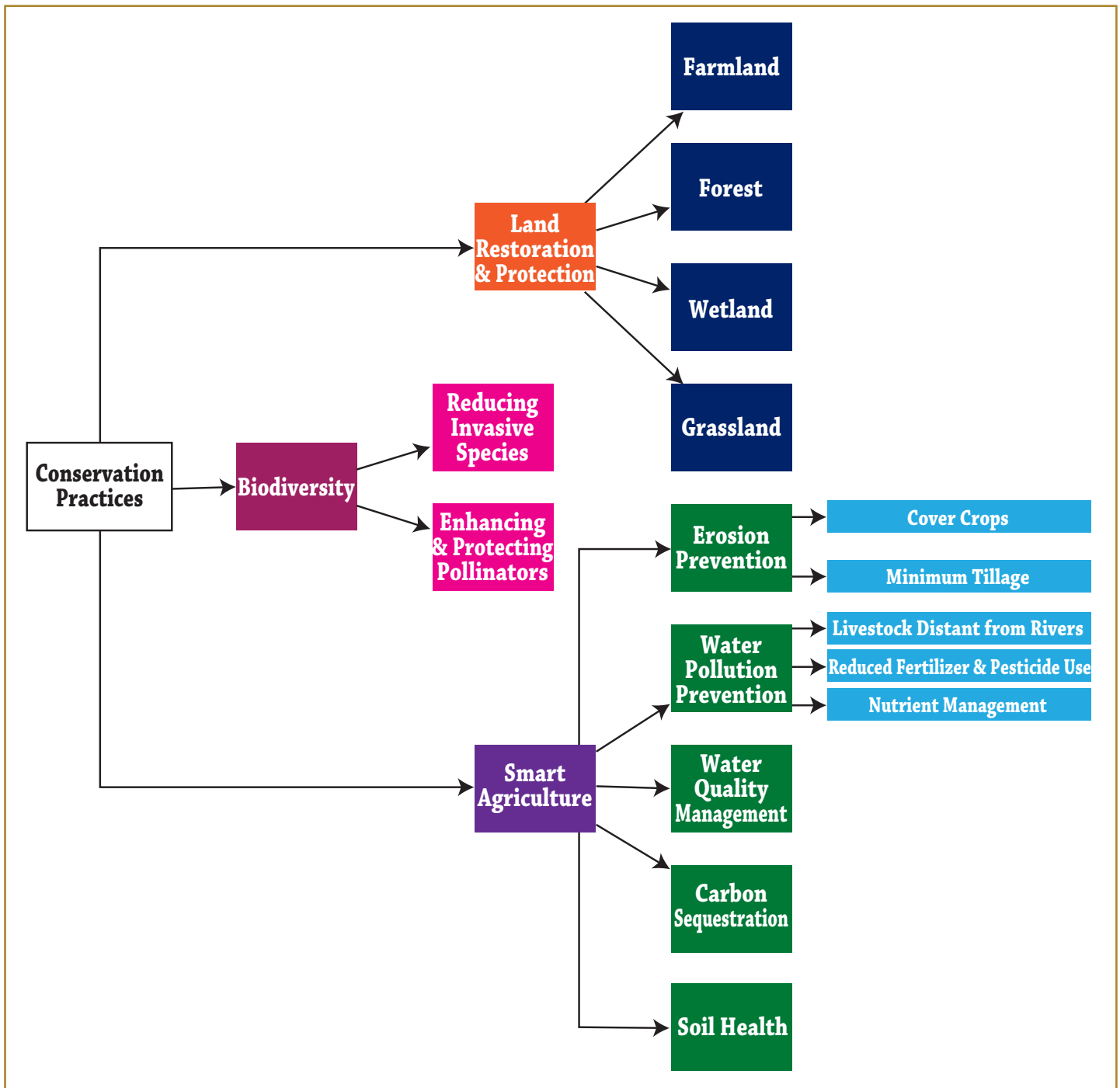


Figure 4 – Areas of focus of key conservation groups

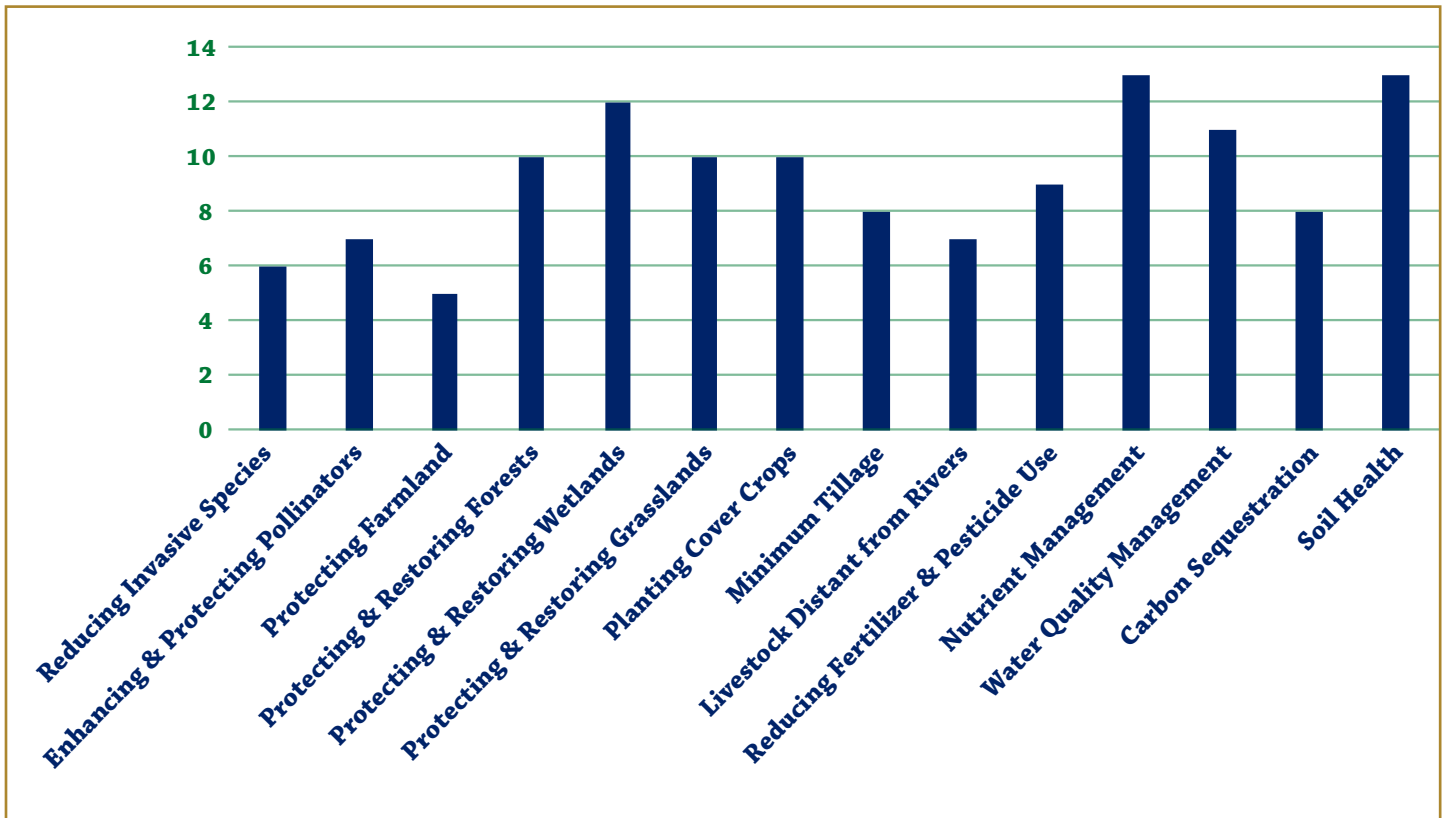
	American Farm Trust ^{12,13,14,15}	Audubon Society ^{16,17}	Ducks Unlimited ^{18,19}	Environmental Defense Fund ^{20,21,22,23}	McKnight Foundation ^{24,25}	National Resources Defense Council ^{26,27,28,29}	National Sustainable Agriculture Coalition ^{30,31}	North America Climate Smart Agriculture Alliance ³²	Sierra Club ^{33,34}	The Conservation Fund ^{35,36,37,38}	The Nature Conservatory ^{39,40,41,42,43,44}	Union of Concerned Scientists ^{45,46,47}	USDA/NRCS ^{48,49,50,51,52}	Walton Family Foundation ^{54,55,56}	World Wildlife Fund ^{57,58,59,60}
Reduce Invasive Species															
Enhancing & Protecting Pollinators															
Protecting Farmland															
Protecting & Restoring Forests															
Protecting & Restoring Wetlands															
Protecting & Restoring Grasslands															
Planting Cover Crops															
Minimum Tillage															
Livestock Distant from Rivers															
Reducing Fertilizer & Pesticide Use															
Nutrient Management															
Water Quality Management															
Carbon Sequestration															
Soil Health															

Each shaded box represents an agricultural conservation priority, as published by each organization.

Understanding the varying focuses and priorities of conservation organizations can help farmers looking for support in specific conservation areas. It is also helpful to have a general overview of the focuses of these groups in order to achieve a clearer idea of the future of conservation agriculture. The collaboration

of these groups, governments and farmers is essential, and a mutual understanding of conservation goals and objectives is beneficial. The conservation priorities of several key players in sustainable agriculture are detailed in these graphics.

Figure 5 – Number of national conservation organizations, by conservation priority



Looking to the Future— Economics of Sustainable Agriculture

Though it's helpful to understand the priorities and focuses of government and NGO conservation programs and groups, understanding the economic impact of these practices is equally important. Unfortunately, it is difficult to quantify the long-term financial benefits of conservation agriculture, especially since environmental health is not necessarily defined by a monetary value. However, there has been some research indicating that conservation agriculture leads to increases in crop yields, and consequently, farm revenue. For example, according to a long-term study comparing the crop yields of plots managed under different tillage practices, no-till operations almost always produced the highest yields.¹⁰ Typically, the combination of sustainable practices used in conservation agriculture means that there are fewer labor, water and fertilizer inputs. The reduction of these inputs results in higher profits.¹¹ Conservation agriculture also has such a high potential for financial benefits due to the fact that it is flexible in its application of sustainable practices.

Different combinations of practices can be used and modified according to land types, climates and existing agricultural infrastructure in order to maximize profits and environmental health.

New innovations in agriculture may provide long-lasting solutions that can protect the environment while simultaneously supporting and sustaining agriculture and feeding the growing population. To this end, a clearer understanding and numerical assessment of conservation agriculture will help to continue and expand the use of these conservation practices. Even with these innovations, the continued support of governments and NGOs will be critical in providing the necessary economic and technical support for farmers hoping to protect their natural resources. Going forward, the discussions surrounding conservation must strive to include all stakeholders in agriculture. Comprehensive solutions are necessary to tackle the issues associated with sustainable farming and a collaborative effort across the industry is necessary. The future of farming is dependent on candid dialogues and an approach that provides a sustainable and healthy future for both farmers and consumers.

Endnotes

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