



Innovative State-Led Efforts to Finance Agricultural Conservation



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About EDF

Environmental Defense Fund (edf.org), a leading international nonprofit organization, creates transformational solutions to the most serious environmental problems. EDF links science, economics, law and innovative private-sector partnerships.



About NASDA

The National Association of State Departments of Agriculture (nasda.org) is a nonpartisan, nonprofit association that represents the elected and appointed commissioners, secretaries and directors of the departments of agriculture in all 50 states and four U.S. territories. NASDA grows and enhances agriculture by forging partnerships and creating consensus to achieve sound policy outcomes between state departments of agriculture, the federal government and stakeholders.

Acknowledgments

This report began as a master's project led by two students at Duke University's Nicholas School of the Environment, John Feldmann and Vincent Gauthier. Environmental Defense Fund served as the client for that project, and Drs. Randall Kramer and Lydia Olander of Duke University advised the project. We would like to thank everyone who contributed to the master's project as well as the final report, especially the state agency staff and other interviewees who contributed their experiences and knowledge.

Foreword

At NASDA, we're constantly searching for innovative ways to advance agriculture in the states. Our members' expertise, closeness to farmers and authority to make change often mean we are the first to understand and act on challenges farmers and ranchers face. Farmers are continually asked to do more with less resources, especially in this unprecedented time of agricultural economic downturn and abundant natural disasters. Yet, even in the midst of turmoil, farmers, ranchers and states are striving to meet environmental conservation demands of the agriculture and food industry. The agriculture economy is in its sixth year of slowing down, a reminder of just how fragile our industry can be. NASDA sees that farmers need support that both enables their pursuit of environmental stewardship and ensures that their business can remain viable into the future.

Discovering exactly how to best conserve our natural resources is a necessary question. Together, EDF and NASDA are partnering on this report to help answer that question. EDF brings their keen eye on environmental stewardship and their commitment to using smart ideas to make a huge difference. This report expounds upon the excellent work states are doing regarding conservation tax credits, cover crop incentives and environmental certifications to increase conservation across the landscape. The report also highlights how these programs work for agricultural producers and states.

As we move forward, NASDA and EDF are committed to working with states on replicating successful models of conservation stewardship. Overall, the solutions included in this report help state and private dollars go further toward increasing the number of acres of farmland conserved across the country. These efforts are ensuring that valuable natural resources are productive well into the future.

As states come together to increase conservation and agricultural productivity, we at NASDA are looking to find unique and effective partners to achieve these goals. Working across partnerships to tackle hard problems is what we do best.

Onward and upward,

A handwritten signature in cursive script, reading "Barbara L. Glenn".

NASDA Chief Executive Officer Dr. Barb Glenn

Executive summary

U.S. farmers are currently facing the most difficult agricultural economy since the 1980s. At the same time, many states are wrestling with the necessity of addressing environmental challenges. Many agricultural conservation practices offer multiple environmental and economic benefits for farmers and society. However, any farm management transition involves a certain amount of cost and risk, and some conservation practices offer purely public benefits. For these reasons, public programs that support farmers in adopting agricultural conservation practices are a critical element in advancing conservation broadly. To fund these programs and practices, a number of states are turning to innovative approaches to finance agricultural conservation.

This report illustrates innovative, state-led programs to finance agricultural conservation that show promise to be successfully replicated in other states without similar programs. While the report focuses on state departments of agriculture, it should be noted that other divisions of state government have authorities to take on environmental challenges, to include state departments of natural resources and state departments of environmental protection.

For this report, both the sources of funding for conservation programs and the financing tools and structures that deliver incentives to farmers were examined. Funding source refers to where the money originates in order to pay for a program, while financing tool or structure refers to how the money is delivered to the farmer or how the farmer benefits from the program. Most agricultural conservation programs are funded through appropriations in federal and state budgets, and money is disbursed to farmers through cost share, in which the state pays for a portion of the total cost of the conservation measure. Against this backdrop, and for the purposes of this report, state agriculture conservation programs are defined as including an innovative financial component if the funding source is not a state's general fund and if the financing tool or structure is not cost share.

The innovatively financed programs researched in this report have experienced successes, but have also faced challenges. For example, many of the programs have been challenged by competition with traditional cost share programs, while others have been challenged by low or decreasing participation rates. In order to learn from the successes and challenges of the programs profiled in this report, future work could see the development of evaluation metrics relating to, for example: cost-effectiveness, environmental outcomes, political feasibility, programmatic flexibility and interactions with other incentive programs.

Ultimately, this report finds that state-level efforts to innovate in the finance of agricultural conservation offer multiple benefits to farmers, as well as to state residents and taxpayers, and society at large. First, these programs provide substantial, direct environmental benefits to residents of the state in the form of improved water quality, reduced agricultural water usage, increased species habitat and the creation of a more resilient food system. Second, they benefit farmers by assisting them in adopting conservation measures, which is particularly important in the current depressed farm economy. Third, they benefit taxpayers by allowing states to tailor programming to the state's specific needs and increase the cost-effectiveness of conservation dollars. And finally, they benefit society at large by serving as incubators for ideas that can be implemented in other states and/or at the federal level.

The National Association of State Departments of Agriculture (NASDA) and Environmental Defense Fund (EDF) intend for this report to lead to greater dialogue between and among states about how to most effectively fund agricultural conservation practices. By providing snapshots of different innovative programs, states can learn from one another's successes and challenges, and in doing so expand the amount and efficacy of state agricultural conservation while ensuring economic opportunities for farmers.

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Introduction

U.S. farmers are currently facing the most challenging agriculture economic conditions since the 1980s. Prices for several major commodities have remained low for several years, depleting farm reserves and requiring farmers across the country to make tough decisions as they develop their budgets. Natural disasters and variable weather have compounded these difficulties in many regions. At the same time, many states are wrestling with the necessity of addressing environmental challenges associated with agriculture. These include state nutrient reduction targets and new or proposed limits to water consumption. States are endeavoring to address these challenges without worsening economic conditions for farmers.

Fortunately, many agricultural conservation practices offer multiple environmental and economic benefits for farmers and society. A growing number of farmers are discovering that conservation practices can reduce costs, improve their resilience to variable weather, and generate additional benefits to water, air and wildlife. However, any farm management transition involves a certain amount of cost and risk, and some conservation practices offer purely public benefits. For these reasons, public programs that support farmers in adopting agricultural conservation practices are a critical element in advancing conservation broadly.

It is widely recognized that existing federal and state agricultural conservation programs, while extremely valuable assets in supporting conservation adoption, do not have sufficient resources to achieve the level of conservation needed to reach a variety of environmental targets. This recognition has driven many states to explore innovative approaches to financing agricultural conservation.

This report seeks to share examples of innovative state-led efforts to finance agricultural conservation, with the goal of fueling a conversation among states about lessons learned and effective program design. Ultimately, the hope is that states will find inspiration in these examples from across the country, and that the lessons learned will prove useful in informing their own agricultural conservation efforts at home.



The importance of agricultural conservation practices

In order to have a thriving agricultural sector that is productive, profitable and sustainable, it is vital to spur conservation measures through agricultural best management practices (BMPs)¹. BMPs are soil and water conservation methods developed for given production types, land types and environmental impacts.² The United States Department of Agriculture has produced a list of 155 BMPs including the following categories:^{3,4}

- Conservation tillage.
- Crop nutrient management.
- Pest management.
- Conservation buffers.
- Irrigation management.
- Grazing management.
- Animal feeding operations management.
- Erosion and sediment control.

Agricultural conservation practices create environmental benefits such as improved water quality, wildlife habitat, soil health, water savings and reduced greenhouse gas emissions at the national, state and local levels.

However, adoption levels are still insufficient to meet most federal or state targets for water quality and other environmental issues. For example, the Iowa Nutrient Reduction Strategy was developed to reduce the loads of nitrogen and phosphorus that Iowa exports to the Mississippi River. In the five years of strategy implementation to date, Iowa has significantly expanded adoption of cover crops, an important BMP for nutrient loss reduction. Cover crop acres increased from an estimated 15,000 acres in 2011 to 760,000 in 2017. Still, it is estimated that at least 10 million acres of cover crops are needed to meet the state's goals.⁵

¹ Mulla, D. J., Birr, A. S., Kitchen, N., David, M. (2006). Evaluating the effectiveness of agricultural management practices at reducing nutrient losses to surface waters. EPA. Accessed on February 20, 2019. Retrieved from: https://www.epa.gov/sites/production/files/2015-07/documents/2006_8_25_msbasin_symposia_ia_session14.pdf.

² Sharpley, A. N., Daniel, T., Gibson, G., Bundy, L., Cabrera, M., Sims, T., Stevens, R., Lumunyon, J., Kleinman, P., Parry, R. (2006). Best Management Practices to Minimize Agricultural Phosphorus Impacts on Water Quality. United States Department of Agriculture. Agricultural Research Service. ARS-163.

³ Clary, J., Wildfire, L., Jones, J. (2012). Agricultural Best Management Practices (BMP) Database: phase 1 literature review. Wright Water Engineers Inc. & Geosyntec Consultants Inc. Accessed on February 20, 2019. Retrieved from: <http://www.bmpdatabase.org/docs/phase1agriculturalbmpdatabaseliteraturereview.pdf>.

⁴ Utah State University Extension. Water Quality: Best Management Practices. Extension.usu.edu. Accessed on February 20, 2019. Retrieved from: <https://extension.usu.edu/waterquality/protectyourwater/howtoprotectwaterquality/bmps/index>.

⁵ Iowa Department of Agriculture and Land Stewardship. Iowa Nutrient Reduction Strategy 2017-18 Annual Progress Report. Retrieved from: http://www.nutrientstrategy.iastate.edu/sites/default/files/documents/NRS2018AnnualReportDocs/INRS_2018_AnnualReport_PartOne_Final_R20190304_WithSummary.pdf.



States' role in supporting agricultural conservation adoption

Historically, the U.S. federal government has provided agricultural conservation funding through federal funds appropriated through the farm bill. The farm bill funding was later accompanied by state-financed agricultural conservation programs starting between the 1970s and 1980s. Many state agricultural conservation programs are implemented through conservation districts. There are “nearly 3,000 conservation districts nationwide that work directly with landowners to conserve and promote healthy soils, water, forests and wildlife.”⁶ They also serve to coordinate assistance from all available sources (public and private, local, state and federal) to develop locally driven solutions to natural resources concerns. Conservation districts are established under state law and typically work closely with states' departments of agriculture.⁷

Federal and state agricultural conservation programs typically fund conservation projects through a cost-share structure in which farmers pay a percentage of the project costs and receive the rest from the public program. State agricultural conservation programs provide an additional source of funding that supplements federal funds allocated through the farm bill. State levels of funding can be a substantial component of conservation dollars available to farmers. For example, farmers in North Carolina received approximately \$5.4 million from state-funded conservation programs in comparison to \$5.1 million from federal farm bill conservation programs in 2017.^{8,9}

State programs are more than just an additional funding source. They often provide more specific and targeted approaches to priority conservation needs and, importantly, allow for new policy incubation for expanded implementation at the federal level. For example, the state of Delaware provides conservation funding that is specifically targeted to poultry operations, which constitute the largest agricultural industry in the state. In Arizona, where water scarcity is a major conservation concern, the state has focused on incentivizing water efficiency BMPs.

⁶ National Association of Conservation Districts. “About Districts.” Retrieved from: <https://www.nacdnet.org/about-nacd/about-districts/>.

⁷ Ibid.

⁸ Environmental Working Group. EWG's Farm Subsidy Database: North Carolina Farm Subsidy Information, 2017. farm.ewg.org. Accessed on February 21, 2019. Retrieved from: <https://farm.ewg.org/region.php?fips=37000&progcode=total&yr=2017>.

⁹ Clark-Sutton, K., Hoffman, J., VanLear, S., Gallagher, M. (2018). North Carolina's Land and Water: Yesterday, Today, and Forever: A Survey of North Carolina's Land and Water Funding. Accessed on February 21, 2019. Retrieved from: <http://ncforever.org/>.



The role of financial assistance in expanding conservation adoption

There are multiple barriers to agricultural conservation adoption, including financial, cultural and operational feasibility. These barriers can vary by region, type of agricultural production, the conservation practice in question and the individual farm and/or farmer. Through field interviews with farmers, the USDA Natural Resource Conservation Service (NRCS) found that project cost was one of the greatest barriers to the implementation of conservation buffers.¹⁰ While cost is often cited as the main obstacle to increased conservation adoption, particularly in a poor farm economy, it is important to consider the full spectrum of barriers to adoption and the role that financial assistance plays in overcoming those barriers.

Agricultural conservation programs typically offer cost-share and are offered to farmers for a period of a few years when they are in the first stages of conservation practice adoption. A 2012 study by the National Farmers Union found that 71% of farmers agree that “conservation programs reduce costs and help farmers’ bottom line.” The study also found that 60% of farmers believe conservation programs are of high priority.¹¹ While cost-share programs are typically designed to support farmers in getting started with a new conservation practice, they have also raised concerns of backsliding once the financial support is no longer available. In addition, while the cost-share structure is relatively straightforward to administer, it only addresses the financial barriers to conservation adoption in one way: reducing the overall cost of the practice. This structure does not address other kinds of financial barriers, such as risk, and it also does not differentiate between practices that are likely to generate a financial benefit to the farmer over the long run (e.g., no-till) and practices that offer a purely societal benefit and no financial benefit to the farmer (e.g., bioreactors).

States have the ability to create innovative agricultural conservation programs to address a variety of financial barriers to conservation adoption in a targeted manner, and also to generate funding for all kinds of conservation programs in new ways. This report explores several examples of such innovation and offers lessons learned for other states interested in creating their own programs.

While this report focuses on increasing funding for agricultural conservation and addressing financial barriers to adoption, it is important to recognize remaining cultural and operational barriers to adoption and consider those obstacles in program design. By addressing barriers to conservation adoption in a holistic manner, long-lasting progress can be achieved.

¹⁰ NRCS. (2002). Adoption of conservation buffers: barriers and strategies. [nrcs.usda.gov](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045630.pdf). Accessed on February 20, 2019. Retrieved from: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045630.pdf.

¹¹ National Farmers Union, Greenberg, Quinland, Rosner Research, Cultivate Impact. (July 2012). U.S. Heartland Farmers Value Conservation Programs and Reject Cutting Farm Bill Conservation Funding. Accessed on February 20, 2019. Retrieved from: https://ohfarmersunion.org/docs/conservation_poll.pdf.



Report methods

The research conducted for this report was completed as part of a master's project by two students at Duke University's Nicholas School of the Environment, with EDF serving as a client for the project.

In order to investigate conservation programs in all 50 U.S. states, the students performed web searches on state agency websites. Once programs were identified, annual reports, fact sheets and application forms were gathered and analyzed. Programs with nontraditional funding sources or financing tools were separated from traditional and noninnovative programs. Nontraditional programs were defined as including funding sources that did not rely on annual state appropriations and/or financing tools other than cost-share grants. Materials such as the reports and fact sheets mentioned above were used to gather information about the nontraditional funding sources and financing tools.

In developing the report, over 90 state-level agricultural conservation programs were examined. Of these, 15 met the "innovativeness" criteria in either the funding source or financing tool(s) utilized. The innovative funding sources include revolving loan funds and double dividend fees. The innovative financing tools include transferable tax credits, cover crop-crop insurance incentives and BMP water allocation flexibility. The 15 programs that utilize these innovative tools were researched in depth via internet searches, literature reviews, and interviews of state officials and a panel of agricultural conservation experts. While the research conducted was extensive, it should not be considered an exhaustive list of all innovative state agricultural conservation programs happening across states.

After the conclusion of the master's project, EDF staff and the members and staff at NASDA contributed additional analysis, commentary and review to produce the final report.

Funding sources

Funding sources describe where the money for conservation originates. While all government funding originates from tax revenue in some form, this report looks at how funds for agricultural conservation are generated and maintained in ways other than appropriations from the states' general funds.

In a survey of state-level programs, the initial wave of state agricultural conservation programs started in the 1970s and 1980s. This trend was possibly a result of a combination of rising concerns over nonpoint source pollution and federal programs that were ill equipped to address subnational environmental issues.

States began to utilize a greater variety of funding sources, such as tax credits and revolving funds, for their agricultural conservation programs in greater numbers in the 2000s, as these funding mechanisms were demonstrably effective and reliable. Table 1 shows state-level agricultural programs for which the funding source is not the state's general fund.

Table 1: State-level agricultural programs funded by sources other than state general funds

State	Funding source	Program name	Financing type
Alaska	Revolving fund	Agricultural Revolving Loan Fund	Loan
Arkansas	Revolving fund	Agriculture Water Quality Loan Program	Loan
California	Greenhouse Gas Reduction Fund	Healthy Soils Program	Grant
California	Greenhouse Gas Reduction Fund	Sustainable Agricultural Lands Conservation Program	Easement
Colorado	Tax credit	Conservation Easement Tax Credit Program	Tax credit
Connecticut	Public/private partnership	Environmental Assistance Program	Grant
Delaware	Public/private partnership	Agricultural Lands Preservation Program	Easement
Delaware	Public/private partnership	Nutrient Management Planning Program	Grant
Georgia	Tax credit	Conservation Tax Credit Program	Tax credit
Iowa	Revolving fund	Livestock Water Quality Program	Loan
Kansas	Kansas Water Plan (dedicated source)	Water Right Transition Assistance Program	Purchase
Kansas	Kansas Water Plan (dedicated source)	Water Resources Cost-Share Program	Grant
Kansas	Kansas Water Plan (dedicated source)	Water Quality Buffer Initiative Program	Grant
Kansas	Kansas Water Plan (dedicated source)	Nonpoint Source Pollution Control Program	Grant
Kentucky	Revolving fund	Equipment Revolving Loan Program	Loan
Maine	Maine Farmland Trust	Farmland Protection Program	Easement

Table 1: Continued

State	Funding source	Program name	Financing type
Maryland	Tax credit	Income Tax Subtraction Modification for Conservation Equipment	Tax credit
Minnesota	Revolving fund	Agricultural Best Management Practices Loan Program	Loan
Minnesota	Revolving fund	Methane Digester Loan Program	Loan
Nebraska	Pesticide fee	Buffer Strip Program	Payment
New Hampshire	License plate sales (moose plates)	Conservation Grant Program	Grant
New Mexico	Tax credit	Agricultural Water Conservation Tax Credit	Tax credit
New York	Environmental Facilities Corporation	Agricultural Nonpoint Source Abatement and Control Program	Grant
North Carolina	Qualified energy conservation bonds	Green Community Program for Renewable Energy	Loan
North Dakota	Oil and gas tax revenues	State Waterbank Program	Grant
Oregon	Oregon Watershed Enhancement Board	Oregon Watershed Enhancement Board Grants	Grant
Pennsylvania	Tax credit	Resource Enhancement and Protection Program	Tax credit
South Carolina	Tax credit	Land Conservation or Environmental Credits	Tax credit
South Dakota	Revolving fund	Conservation Tillage Loan Program	Loan
South Dakota	Revolving fund	Conservation Revolving Loan Program	Loan
Virginia	Tax credit	Land Preservation Tax Credit	Tax credit
Virginia	Tax credit	Agricultural BMP Tax Credit Program	Tax credit
Wyoming	Revolving fund	Wyoming Wildlife and Natural Resource Trust	Loan

From the programs listed in table 1, eight programs were selected to examine in more detail. The map below shows the geographical distribution of these programs. The programs fall into two categories of funding sources: revolving funds and environmental double dividends. The following sections will outline mechanisms through which these programs are funded.

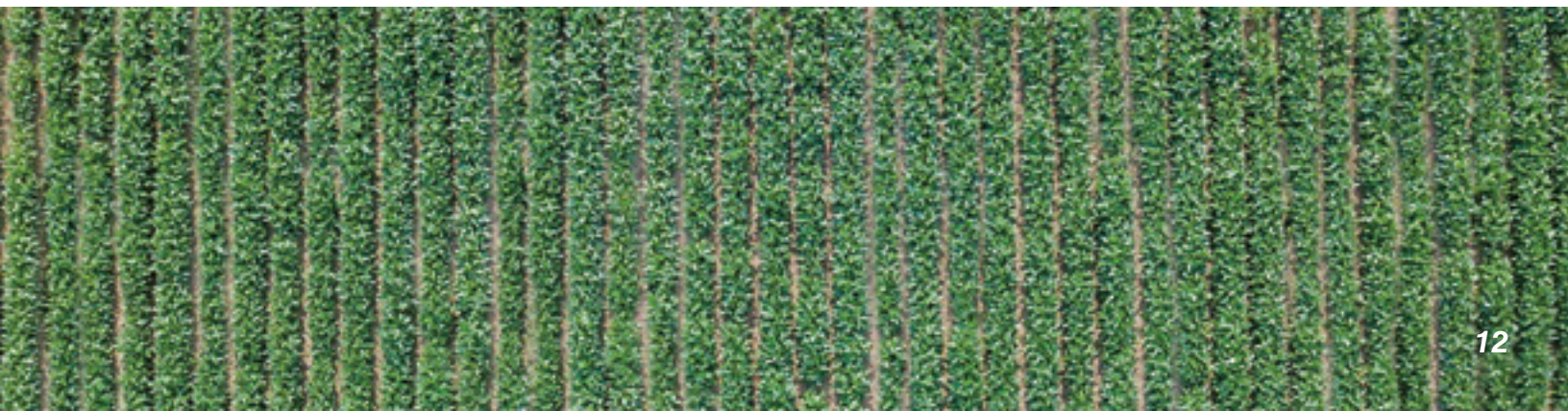
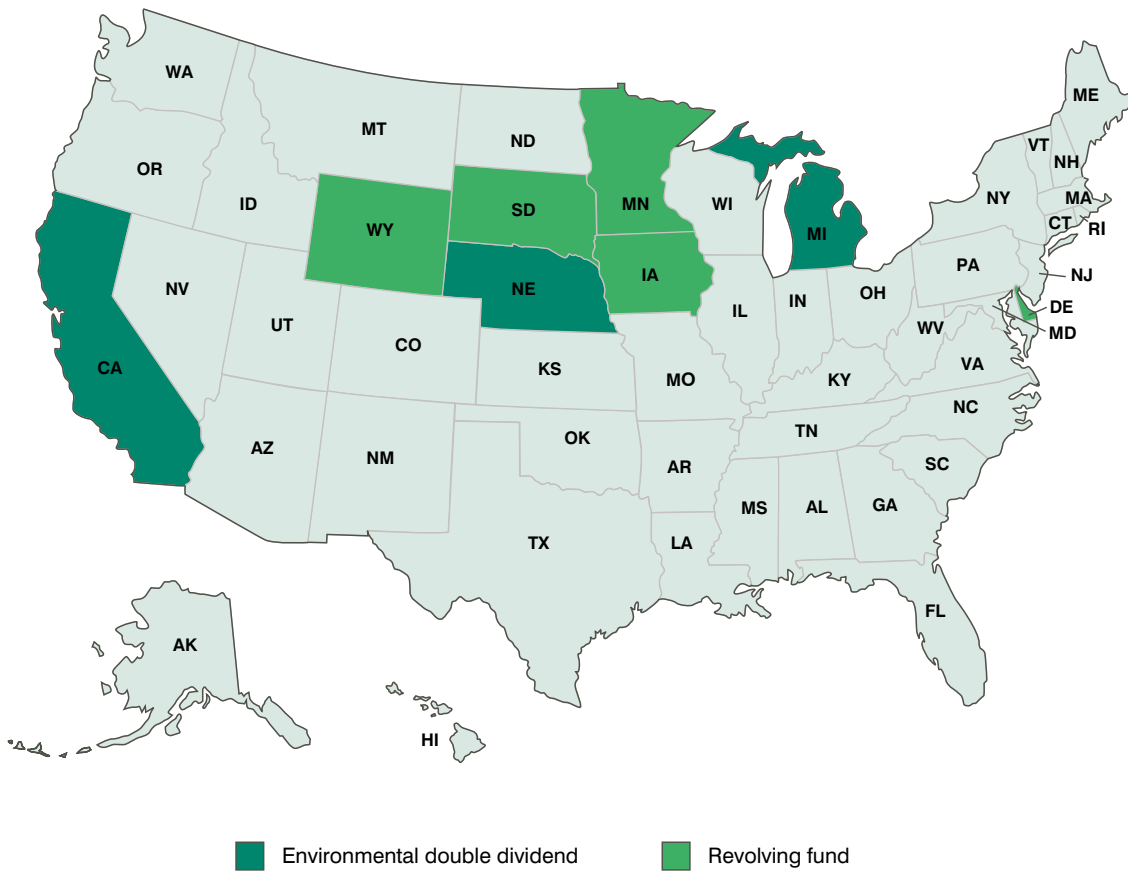


Figure 1: States studied that utilize innovative agricultural conservation funding sources



State revolving fund

A state revolving fund (SRF) is a funding source that originates with federal, state and other capital and then issues loans to borrowers. As loans are repaid with interest, the underlying fund grows, and these increased funds are used to issue more loans. Thus, it is said that these funds “revolve.” States can also issue bonds in order to contribute to the SRF. The structure of a revolving fund is shown in figure 2.

Figure 2: Structure of a state revolving fund



The federal Clean Water State Revolving Fund (CWSRF), created in 1987, and the federal Drinking Water State Revolving Fund (DWSRF), created in 1997, are two programs that are administered by states today. Since the program’s inception, as of 2017, CWSRFs had leveraged \$42 billion in federal appropriations into \$126 billion, which has been issued through 38,441 individual loans.¹² Both of these programs require that states provide 20% matching funds to accompany the federal capitalization grant.

At present, all 50 states implement a CWSRF, and a large majority of loans under this program (96%) have been used for water treatment projects. The first nonpoint source loans addressing agricultural pollution from state CWSRFs were issued in 1990, and in 2006, \$370.3 million was spread across 1,183 projects addressing nonpoint source pollution. In total, \$4.6 billion in loans has gone to projects aimed at reducing nonpoint source pollution.¹³

Some states have used a revolving fund mechanism in order to implement their own agricultural conservation loan programs, separate from the two federal SRF programs. Alaska, for example, set up an Agricultural Revolving Loan Fund in 1953, well before the federal program was put in place, and this fund has grown to \$11.8 million as of March 2017.¹⁴

¹² 2017 CWSRF Annual Report. Environmental Protection Agency. Accessed on February 20, 2019. Retrieved from: https://www.epa.gov/sites/production/files/2018-03/documents/final_2017_cwsrf_annual_report_for_web2.pdf.

¹³ Ibid.

¹⁴ Alaska Agricultural Revolving Loan Fund, Alaska Department of Natural Resources. Accessed on October 10, 2019. Retrieved from: http://dnr.alaska.gov/ag/ag_arlf.htm.



Delaware Clean Water State Revolving Fund

Delaware's CWSRF contains a program focused solely on nonpoint source pollution: the Agricultural Nonpoint Source Pollution Program (AgNPS). This program has historically provided loans for poultry and dairy farmers to implement management practices that reduce nutrient and effluent runoff. Delaware has a large poultry industry, and 784 of the 830 loans administered under this program have gone to poultry farmers.¹⁵

Farmers must be under contract with certain integrators in order to be eligible to receive a loan. These integrators have signed a memorandum of understanding guaranteeing repayment of the loan. There are currently four poultry integrators (Perdue, Allen Harim, Mountaire and Tyson) and two dairy integrators (Land O' Lakes and Dairy Farmers of America) that participate in this program. This arrangement entirely eliminated defaults on loans.¹⁶

The number of loans in the AgNPS program has declined steeply in recent years, with fewer than a dozen loans currently under management.¹⁷ Delaware state officials believe that this decline is a result of a number of factors: first, that many candidate farms have already participated in the program and have therefore already implemented the BMPs covered in the program; second, that farmers prefer cost-share programs to loan programs, and therefore are not enrolling in this program; and third, that widely available low interest rates are allowing farmers to borrow from commercial lenders, thus nullifying the need for such a low-interest loan program.¹⁸

¹⁵ Conversation with Carla Cassell-Carter, Chief of Administration, Delaware Department of Natural Resources and Environmental Control, December 11, 2018.

¹⁶ Delaware Department of Natural Resources. Agriculture Nonpoint Source (AgNPS) Loan Program for Dairy Producers: Fact Sheet. Dnrec.alpha.delaware.gov. Accessed on January 4, 2019. Retrieved from: <http://www.dnrec.delaware.gov/swc/SiteCollection/Documents/Soil/District/dairy.pdf>.

Delaware Department of Natural Resources. Agriculture Nonpoint Source (AgNPS) Loan Program for Poultry Producers: Fact Sheet. Dnrec.alpha.delaware.gov. Accessed on January 4, 2019. Retrieved from: <http://www.dnrec.delaware.gov/swc/SiteCollection/Documents/Soil/District/poultry.pdf>.

¹⁷ Private conversation with Carla Cassell-Carter, Chief of Administration, Delaware Department of Natural Resources and Environmental Control, December 11, 2018.

¹⁸ Ibid.



Iowa Clean Water State Revolving Fund

Iowa provides a Clean Water State Revolving Fund (CWSRF) through the state Department of Natural Resources and the Iowa Finance Authority for the purpose of improving water quality from public water sources and nonpoint sources such as agriculture. From 1989 to 2002, the Iowa SRF program financed public drinking water and wastewater projects. In 2003, the program was adjusted in order to include nonpoint source water quality projects, including agricultural BMPs.¹⁹ The nonpoint source pollution aspects of the program are administered by the Iowa Department of Agriculture and Land Stewardship. The Iowa SRF program has four subcategories of loans: the local water protection program funds practices such as buffer strips, field borders and constructed wetlands; the livestock water quality program funds projects such as manure storage; a program to replace or repair home septic systems; and a program to fund storm water management practices.²⁰

Each year a portion of the total Iowa SRF fund is allocated to nonpoint source (agricultural) projects based on the demand for funding in the previous year. The nonpoint source project loans are administered through a linked deposit approach. Upon the approval of a project, the state deposits the loan amount into one of 400 participating financial partners that must provide the loan at an interest rate at or below 3%. As the borrower pays back the loan, the state withdraws the funds from the lender. The lender underwrites the loan and receives the interest payments. The loan durations can be up to 15 years.²¹

Iowa State University conducted a program evaluation of the Iowa SRF in 2009. The evaluation found that farms that participated in the program were smaller than average farms not participating in the program, but they spent at least as much

on conservation practices as the larger farms. The study also found that the farms participating in the program relied less on cost-share programs and farm operating budgets than farms that did not participate in the program. The farms that participated in the program were also more likely to have heard about the CWSRF program from their local bank than those that had not heard about the program at the bank. The evaluation found that the three most prevalent reasons for why farmers did not participate in the program were preferring to cover conservation costs through the use of farm operating expenses, having enough funding through cost-share support and waiting for cost-share support.²²

An additional innovative component of the Iowa SRF is its sponsorship lending. Many nonpoint source water quality projects lack a revenue stream, which makes it difficult to repay a loan. Sponsorship lending helps to address this issue by pairing a traditional publicly owned treatment works (POTW) project with a nontraditional one, usually a nonpoint source project. A municipality receives a loan with a reduced interest rate as compensation for also undertaking (i.e., sponsoring) a nontraditional project. This arrangement works best when the cost of the combined project is equal to or less than the cost of a stand-alone POTW project when financed at normal SRF interest rates.²³ Iowa is a leader in developing sponsored projects. Iowa's SRF sets aside \$10 million each year for sponsored projects. Through June 2018, \$60 million for sponsored projects has been approved, which includes 90 sponsored projects in 72 communities and one state park.²⁴

¹⁹ T. Toigo, personal communication, December 2018.

²⁰ Iowa SRF. Clean Water Loan Program. [iowasrf.com](http://www.iowasrf.com). Accessed on January 7, 2019. Retrieved from: http://www.iowasrf.com/program/clean_water_loan_program/.

²¹ T. Toigo, personal communication, December 2018.

²² Arbuckle Jr., J. G., Swalla Holmes, M. (2009). Program Evaluation of the State Revolving Fund Loan Programs for Agricultural Best Practices: Final Report. Sociology Technical Report 1030, Iowa State University, Department of Sociology. Accessed on January 7, 2019. Retrieved from: https://lib.dr.iastate.edu/soc_las_reports/8/.

²³ U.S. Environmental Protection Agency. "Sponsorship Lending and the Clean Water State Revolving Fund." Accessed on 7/26/2019. Retrieved from: https://www.epa.gov/sites/production/files/2017-10/documents/sponsorship_style_newest_final.pdf.

²⁴ Iowa State Revolving Fund. "Water Resource Restoration Sponsored Projects." Accessed on 7/26/2019. Retrieved from: http://www.iowasrf.com/media/cms/Sponsored_Projects_Handout_E1BF13A15D660.pdf.

Environmental double dividend fee structure

The double dividend fee structure is built from that idea that if an environmental tax can be used to reduce distortionary taxes, such a program can produce environmental benefits and lead to increased economic efficiency.²⁵ Distortionary taxes are taxes that serve to decrease economic efficiency, such as a proportional income tax. For purposes of this report, double dividend is used to describe a situation in which a fee is collected from a practice that can cause environmental harm, and revenues derived from this fee are used to fund practices that increase environmental quality.



Michigan Agriculture Environmental Assurance Program

Michigan's Agriculture Environmental Assurance Program (MAEAP) is funded by pesticide and fertilizer water quality protection fees. The state assesses a \$100 pesticide registration fee and a \$270 water quality protection fee on over 15,000 pesticides that are sold in the state, as well as a \$1 fee on every ton of fertilizer sold. (The program also receives funding from an annual state appropriation of \$1 million). These sources bring total state funding for the program to nearly \$9 million annually.²⁶ This program correlates funding for conservation practices with the amount of pesticides and fertilizers purchased in the state.

Established in 1997 and later codified by then-Governor Snyder in 2011 with the signing of Senate Bill 122 and House Bill 4212, MAEAP is a voluntary program that recognizes farmers who are top stewards of their land. MAEAP helps farmers adopt cost-effective practices that reduce erosion and runoff into ponds, streams and rivers. Farmers who participate in MAEAP can earn recognition as a top steward in the community, regulatory protections and preferred consideration for technical assistance and cost share.²⁷

Nebraska Buffer Strip Program



Nebraska's Buffer Strip Program annually assesses a \$160 fee on each pesticide registered in the state in order to fund the program. Currently the program provides \$6.4 million to buffer projects under contract in the state, and provides an annualized contract budget of approximately \$660,000.²⁸ The program offers payments for two eligible types of buffer strips: a narrow filter strip and a riparian forest buffer strip. Program payments can be used in tandem with federal programs, with a maximum total payment to a farm of \$250 per acre.

This program, similar to MAEAP discussed above, also correlates funding level with environmental concern. In other words, the greater the number of pesticides registered, the greater funding the state will have for buffer strip projects.²⁹

²⁵ Fullerton, D. and Metcalf, G., Environmental Taxes and the Double Dividend Hypothesis, National Bureau of Economic Research, Working Paper 6199, 1997.

²⁶ Hamilton, William. "Budget Briefing: Agriculture and Rural Development." January 2019. Retrieved from: http://house.michigan.gov/hfa/PDF/Briefings/MDARD_BudgetBriefing_fy18-19.pdf.


²⁷ Michigan Agriculture Environmental Assurance Program. Retrieved from: <https://maeap.org/>.

²⁸ "Nebraska Buffer Strip Program Summary," Nebraska Department of Agriculture, August 1, 2018.

²⁹ "Nebraska Buffer Strip Program," Nebraska Department of Agriculture. Accessed on January 8, 2019. Retrieved from: http://www.nda.nebraska.gov/pesticide/buffer_strip.html.

The California Department of Food and Agriculture (CDFA) manages the Healthy Soils Program (HSP), which is funded in part by revenue from California's cap-and-trade program. The California Global Warming Solutions Act of 2006 established a cap-and-trade market in California to reduce greenhouse gas emissions. Entities that emit greenhouse gases can purchase allowances in an auction. The state's portion of the auction proceeds are deposited into the Greenhouse Gas Reduction Fund, which the legislature then appropriates to administering agencies for programs that result in further greenhouse gas emission reductions.³⁰ In 2017, the Healthy Soils Program received \$7.5 million from the state's cap-and-trade proceeds, also known as California Climate Investments. In 2018, CDFA was appropriated \$10 million for the Healthy Soils Program and also received \$5 million from California Climate Investments.³¹

HSP stems from the California Healthy Soils Initiative, a collaboration of state agencies and departments to promote the development of healthy soils on California's farmlands and ranchlands. The HSP Incentives Program provides financial assistance to implement conservation management practices that improve soil health, sequester carbon and reduce greenhouse gas emissions. The HSP demonstration projects showcase California farmers' and ranchers' implementation of HSP practices. Eligible practices include cover crops, no-till, reduced-till, mulching, compost application and conservation plantings.³² In 2018, CDFA selected 194 projects for the HSP Incentives Program requesting \$8,667,596 in grants.³³



California Healthy Soils Program

³⁰ California Climate Investments. About. Accessed on 7/22/19. Retrieved from: <http://www.caclimateinvestments.ca.gov/about-cci>.

³¹ Ibid.

³² Healthy Soils Program. California Department of Food and Agriculture Office of Environmental Farming & Innovation. Accessed on 7/22/19. Retrieved from: <https://www.cdfa.ca.gov/oefi/healthsoils/>.

³³ Healthy Soils Program Incentives Program. California Department of Food and Agriculture Office of Environmental Farming & Innovation. Accessed on 7/22/19. Retrieved from: <https://www.cdfa.ca.gov/oefi/healthsoils/IncentivesProgram.html>.

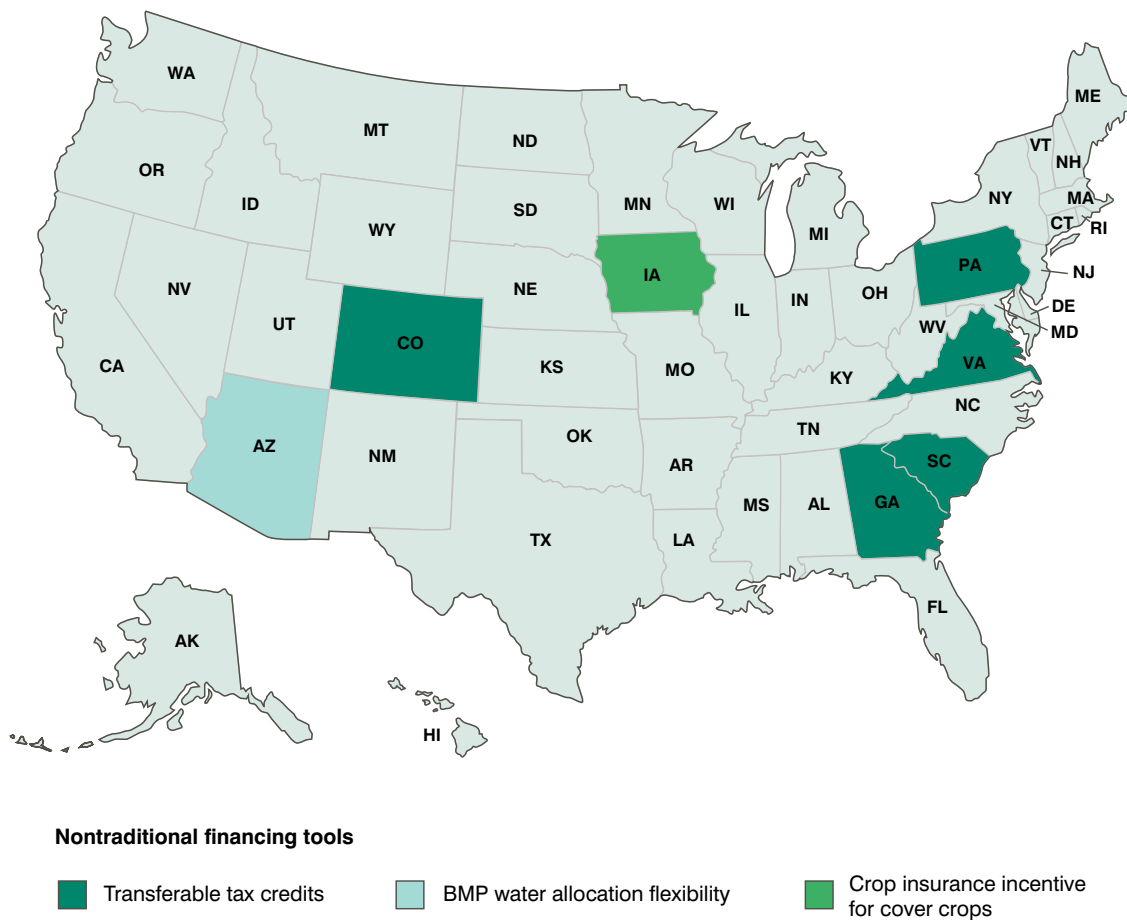
Financing tools



“Financing tool” in this report is a mechanism used by a state to transfer funding to a landowner or farmer for a certain project or practice, providing a dollar amount, or promise of future value, in exchange for a certain agricultural conservation practice. These tools differ from the common practice of cost-share programs that provide grants for agricultural conservation projects. The programs outlined below provide financial flexibility and market premiums to farmers for implementing conservation practices.

Seven out of 50 states were identified that utilize nontraditional financing tools to support agricultural conservation and use the following four financing tools: transferable tax credits, BMP water allocation flexibility and crop insurance incentives. Figure 4 shows the geographic distribution of these nontraditional financing tools.

Figure 3: States studied that utilize innovative agricultural conservation financing tools



Transferable tax credit

In 1983, North Carolina created the first state land conservation tax credit program.³⁴ Landowners in North Carolina could sell or place a conservation easement on their land in exchange for a tax credit worth 25% of the land's fair market value. A conservation easement is a legally binding instrument between a landowner and a state or land trust that restricts the land to certain management practices that will maintain its conservation value. In North Carolina, the tax credits could not exceed \$250,000 per individual or \$500,000 per corporation or partnership.³⁵ As of 2012, the land preserved under this program was valued at \$1.3 billion; however, in 2013 the conservation tax credit program in North Carolina was repealed as part of a larger tax cutting agenda.³⁶

Nevertheless, North Carolina's conservation tax credit program initiated interest in conservation tax credit programs that led to the development of transferable conservation tax credits. Transferable conservation tax credit programs have been implemented by Colorado, Georgia, Pennsylvania, South Carolina and Virginia. As with North Carolina, the Conservation and Preservation Tax Credit Program in New Mexico was repealed in 2013. Table 2 shows the current programs that exist in each of these states and their years of inception.

Table 2: Transferable conservation tax credit programs

State	Program	Year of inception
Colorado	Conservation Tax Credit Program	2000
Georgia	Conservation Tax Credit Program	2006
Pennsylvania	Resource Enhancement and Protection Program	2007
South Carolina	Land Conservation or Environmental Credits	2001
Virginia	Land Preservation Tax Credit	2006

³⁴ Conservation Trust for North Carolina. (2014). A sprint to the finish: the final days of the North Carolina Conservation Tax Credit. Accessed on January 27, 2019. Retrieved from: <https://www.ctnc.org/ctnc-releases-report-detailing-importance-nc-conservation-tax-credit/>.

³⁵ Ibid.

³⁶ Ibid.



General mechanism

A transferable conservation tax credit program includes an exchange of tax credits for a conservation easement or a portion of the cost of conservation BMPs and the freedom for landowners to sell their tax credits to other taxpayers. By using a transferable conservation tax credit model, a state provides tax credits to landowners at a certain percentage of the fair market value of the land or of the certain BMP being implemented. Once it is time for the landowner to pay her taxes, she can use the tax credits to reduce tax liability, or sell the credits to another taxpayer in exchange for cash.³⁷

The ability to sell the tax credit allows the landowner to take advantage of the value of a credit if she would otherwise be unable to take advantage of it. For example, if a landowner has a tax liability of \$10,000 and she receives a \$15,000 conservation tax credit, she can sell the \$5,000 of tax credits that she is unable to use toward her own tax liability. The transferability of these tax credits creates a market for conservation tax credits between landowners and taxpayers who wish to offset some tax liability.

The cost to the state of a conservation tax credit program is found in the foregone tax revenue given out to landowners in the form of tax credits. Conservation tax credits can generate significant amounts of funding. For example, the Pennsylvania Resource Enhancement and Protection Program (REAP) provides an average of \$13 million per year for agricultural BMPs.³⁸ The Colorado Conservation Tax Credit program provided \$8 million in agricultural conservation tax credits in 2016 for agricultural land preservation.

State programs utilizing this basic mechanism differ across several attributes, which are described in detail below. They include credit carryforward, credit transferability, business sponsorship, credit refunds, funded practices and the percentage of land value credited.

³⁷ Hocker, P.M. (2005). Transferable State Tax Credits as a Land Conservation Incentive. In J. N. Levitt (Ed): *From Walden to Wall Street* (pp. 124-137). Washington, DC. Island Press: Lincoln Institute for Land Policy.

³⁸ The Pennsylvania Farm Bill, signed by Governor Wolf on July 1, 2019, expands REAP by \$3 million, to \$13 million.



Credit carryforward

Tax credit carryforward is a form of financial flexibility that allows landowners whose tax credit is higher than their tax liability to carry the unused credits into subsequent years. For example, a farmer with a \$10,000 tax liability and \$15,000 worth of tax credit can carry the unused \$5,000 worth of credit into the subsequent year to offset that next year's tax liability. The state programs identified in this report set limits to how many years credits can be carried forward. Colorado and Pennsylvania have the longest carryforward period of 15 years, and Georgia has the shortest carryforward period of 10 years.^{39, 40, 41} The New Mexico Agricultural Water Conservation Program, repealed in 2013, had an even shorter carryforward period of five years.⁴²

Credit transferability

A second form of financial flexibility is the transferability of unused tax credits. As previously described, conservation tax credit transferability allows farmers or landowners whose conservation tax credits exceed their tax liability to sell the credits to other taxpayers for cash.⁴³ This allows farmers to receive cash sooner rather than using the tax credits in future years. It also provides direct cash to farmers who do not foresee being able to use their credits with the carryforward in future years either because of limited farm taxable income in the future or because of the carryforward limit.

Some of the state programs analyzed in this report place limitations on transferability. The Pennsylvania's REAP only allows landowners to sell tax credits one year after receiving the credits.⁴⁴ Therefore, the value of the tax credit must be carried forward at least one year, decreasing its value by the rate of inflation. The Georgia Conservation Tax Credit does not allow the credit to be sold more than once. As such, a farmer can sell her unused tax credits to more than one taxpayer, but those taxpayers cannot resell the credits.⁴⁵

Credit traders shared the estimated range of prices for which Colorado and Virginia conservation tax credits are sold. In its infancy, the Colorado Conservation Tax Credits were bought by the prominent conservation tax credit trader, the Conservation Resource Center, at a price of \$0.80 on the dollar and sold to other taxpayers at \$0.90 on the dollar, with the remaining \$0.10 going to the trader. From 2003 to 2005, the price to landowners remained relatively constant, with the rate to traders ranging between \$0.05 to \$0.10 on the dollar.⁴⁶ When the Virginia Land Preservation Program began in 1999, the first conservation credit sale price was \$0.45 on the dollar.⁴⁷ In 2003, the price to buyers ranged between \$0.60 and \$0.80 with \$0.50 going to the seller.⁴⁸

³⁹ Watkins, K. (2017). Memorandum: Conservation easement tax credit program. Colorado Legislative Council Staff. Accessed on January 27, 2019. Direct communications with Kate Watkins.

⁴⁰ Pennsylvania State Conservation Commission. (2018). Resource Enhancement and Protection Program: guidelines fiscal year 2018. Accessed on January 27, 2019. Retrieved from: <http://lancasterconservation.org/wp-content/uploads/2018-19-REAP-Guidelines.pdf>.

⁴¹ Georgia Department of Natural Resources. Georgia Conservation Tax Credit Program-GDTCP: certification process and procedures, 2013. Accessed on January 27, 2019. Retrieved from: https://glcp.georgia.gov/sites/glcp.georgia.gov/files/related_files/document/glcp-dnr-gtcp-tax-credit-procedures.pdf.

⁴² New Mexico Taxation and Revenue. (2015). Agricultural Water Conservation Tax Credit Claim Form. www.tax.newmexico.gov. Accessed on January 28, 2019. Retrieved from: <http://www.tax.newmexico.gov/Tax-Professionals/conservation-preservation-tax-credits.aspx>.

⁴³ Hocker, P. M. (2005). Transferable State Tax Credits as a Land Conservation Incentive. In J. N. Levitt (Ed): From Walden to Wall Street (pp. 124-137). Washington, DC. Island Press: Lincoln Institute for Land Policy.

⁴⁴ Pennsylvania State Conservation Commission. (2018). Resource Enhancement and Protection Program: guidelines fiscal year 2018. Accessed on January 27, 2019. Retrieved from: <http://lancasterconservation.org/wp-content/uploads/2018-19-REAP-Guidelines.pdf>.

⁴⁵ Georgia Department of Revenue, Income Tax Division. Rules of the Georgia Department of Revenue Income Tax Division: 560-7-8-.5 Conservation Tax Credit. Accessed on January 28, 2019.

⁴⁶ Hocker, P. M. (2005). Transferable State Tax Credits as a Land Conservation Incentive. In J. N. Levitt (Ed): From Walden to Wall Street (pp. 124-137). Washington, DC. Island Press: Lincoln Institute for Land Policy.

⁴⁷ Hocker, P. M. (2010). Virginia's State Tax Credit for Land Conservation. In D. G. Burke and J. E. Dunn (Eds.). A Sustainable Chesapeake: Better Models for Conservation (pp. 135-144). The Conservation Fund, Arlington, VA.

⁴⁸ Hocker, P. M. (2005). Transferable State Tax Credits as a Land Conservation Incentive. In J. N. Levitt (Ed): From Walden to Wall Street (pp. 124-137). Washington, DC. Island Press: Lincoln Institute for Land Policy.

Business sponsorship

Pennsylvania's REAP allows businesses to sponsor BMP implementation under its tax credit program. The state must receive a signed agreement between the business and the landowner that certifies that the land operator will comply with REAP requirements. This allows landowners to work with businesses that will help finance the practice in exchange for the tax credit receivable through the program. These businesses are often banks or local lending institutions and often banks with long-standing relationships with farmers are willing to write off loans for conservation practices in exchange for the tax credits. The advantage of this arrangement is that some farmers are more likely to participate in such a program because they feel more comfortable working with their bank rather than receiving credits from the state government.⁴⁹

Credit refunds

Credit refunds refer to cash payments from the state to landowners who cannot use the full amount of their tax credit due to their tax liability amount. Most of the programs do not allow for credit refunds; however, Colorado provides partial refunds in years when the government revenue exceeds the limit written into the Taxpayer's Bill of Rights.⁵⁰ The refundable amount to a landowner in such years, in addition to its nonrefundable (usable) credits, cannot exceed the \$50,000 credit limit.⁵¹

Funded practices

Under the transferable conservation tax credit model, states can choose restrictions on which management practices are allowed to receive tax credits. The most basic conservation tax credit model provides tax credits for a percentage of the fair market value of an agricultural easement. Using a pure easement tax credit restricts the development rights of the land into anything other than farmland but does not place specific agricultural management practice restrictions on the farmer. For example, Colorado provides tax credit value of up to 75% of the first \$100,000, based on the difference between the appraised value of their land before and after the easement is recorded, and 50% of the remaining value.⁵² Any agricultural land in Colorado is eligible in the program, regardless of its agricultural management practices.

Other states place management practice limitations within conservation easement tax credit contracts. For example, the Georgia Conservation Tax Credit Program imposes state-defined BMPs on agricultural easements.⁵³ Similarly, Virginia's Land Preservation Tax Credit Program necessitates a written conservation plan in the contract that includes agricultural best management practices.⁵⁴

However, transferable conservation tax credit programs do not need to follow an easement model. Tax credits may be provided to offset the cost to a farmer who decides to implement a BMP such as cover cropping or a waste management system. Pennsylvania's REAP provides transferable tax credits valued between 50% and 75% of the BMP costs.⁵⁵ The program provides different percentages of cost coverage for different projects, including costs related to project design and planning, management, building and materials, inspections and insurance. The variety of funded practice structures implemented by states demonstrates that transferable conservation tax credit programs can be used in many different agricultural contexts and for specific environmental aims.

⁴⁹ Semke, J. Personal communication. February 1, 2019.

⁵⁰ In 1992, Colorado voters adopted TABOR, amending their constitution to limit the amount of revenue the state can retain and spend, with surplus revenues to be refunded to taxpayers. Any tax increases must be adopted by the voters through a referendum.

⁵¹ Watkins, K. (2017). Memorandum: Conservation easement tax credit program. Colorado Legislative Council Staff. Accessed on January 27, 2019. Direct communications with Kate Watkins.

⁵² Ibid.

⁵³ Georgia Department of Natural Resources. Georgia Conservation Tax Credit Program-GDTCP: certification process and procedures, 2013. Accessed on January 27, 2019. Retrieved from: https://glcp.georgia.gov/sites/glcp.georgia.gov/files/related_files/document/glcp-dnr-gdctp-tax-credit-procedures.pdf.

⁵⁴ Commonwealth of Virginia. (2016). Calendar year 2016 land preservation tax credit conservation value summary. Accessed on January 27, 2019. Retrieved from: <https://rga.lis.virginia.gov/Published/2017/RD565/PDF>.

⁵⁵ Pennsylvania State Conservation Commission. (2018). Resource Enhancement and Protection Program: guidelines fiscal year 2018. Accessed on January 27, 2019. Retrieved from: <http://lancasterconservation.org/wp-content/uploads/2018-19-REAP-Guidelines.pdf>.

Easement or management practice tax credit percentage coverage



Colorado Conservation Tax Credit Program



Georgia Conservation Tax Credit Program



Pennsylvania Resource Enhancement and Protection Program



South Carolina Land Conservation or Environmental Credits



Virginia Land Preservation Tax Credit Program

When lawmakers first develop transferable conservation tax credit programs, they determine the percentage of easement value or BMP costs for which tax credits will be provided. The Colorado Conservation Tax Credit Program provided the highest percent coverage by covering 75% of the first \$100,000 in fair market value of the easement land, and 50% of the remaining easement value.⁵⁶ On the lower end, South Carolina and Georgia provide 25% coverage of easement lands. In addition to percent coverage limitations, states hold maximum credit amounts per landowner. These maximum credit amounts vary widely, from a \$1.5 million maximum tax credit in Colorado to a \$50,000 maximum tax credit in Virginia.^{57, 58} South Carolina uniquely uses a per-acre valuation, limiting the maximum tax credit to \$250 per acre and a landowner maximum of \$52,000.⁵⁹

The percent coverage used by these programs plays an important role in dictating the cost of the program to the state. A number of programs have reduced the percent coverage over time. For example, when the Colorado Conservation Tax Credit Program was enacted in 2000, the tax credits covered 100% of the easement land value. From 2003 to 2006, the coverage was changed to 100% of the first \$100,000 and 40% of the remaining easement value. In 2007, the percent coverage was again changed to 50% of easement value, and finally in 2015 the state settled on the current percent coverage. Virginia also adjusted its percent coverage from 50% to 40% in 2007.⁶⁰

States can also control the program costs of their transferable tax credit programs through the landowner credit caps. For example, the Colorado Conservation Tax Credit program changed its per-easement cap along with the percent coverage changes previously mentioned. The original per easement cap was set at \$100,000, increased to \$260,000 in 2003, increased to \$375,000 in 2007, and finally increased to \$1.5 million in 2015.⁶¹ In Virginia, the per easement cap decreased from \$100,000 in 2015 to \$20,000 in 2016, and \$50,000 thereafter.⁶²

The final way in which states can limit the costs of their conservation tax credit programs is through a program-wide cap. This cap limits the credit value that the administrative agency can spend each year. The program-wide credit cap varied from \$75 million in Virginia to \$30 million in Georgia.^{63, 64} States have also adjusted the program-wide cap over the years to limit the foregone tax revenue caused by the program. For example, the Virginia Land Preservation Tax Credit Program has continually adjusted its maximum cap since the program began in 2007. The original cap was set at \$100 million adjusted in following years by the consumer price index. In 2015, the cap was lowered to \$75 million.⁶⁵

⁵⁶ Watkins, K. (2017). Memorandum: Conservation easement tax credit program. Colorado Legislative Council Staff. Accessed on January 27, 2019. Retrieved from: direct communications with Kate Watkins.

⁵⁷ Ibid.

⁵⁸ Commonwealth of Virginia. (2016). Calendar year 2016 land preservation tax credit conservation value summary. Accessed on January 27, 2019. Retrieved from: <https://rga.lis.virginia.gov/Published/2017/RD565/PDF>.

⁵⁹ South Carolina Department of Revenue. (2018). Land Conservation or Environmental Credits. Accessed on January 27, 2019. Retrieved from https://dor.sc.gov/resources-site/lawandpolicy/Documents/SC_TIED_2-PartF.pdf.

⁶⁰ Commonwealth of Virginia. (2016). Calendar year 2016 land preservation tax credit conservation value summary. Accessed on January 27, 2019. Retrieved from: <https://rga.lis.virginia.gov/Published/2017/RD565/PDF>.

⁶¹ Seidl, A., Anderson, D., Bennett, D., Greenwall, A., Menefee, M. (2017). A CSU Study: Investing in Colorado: Colorado's Return on Investments in Conservation Easements: Conservation Easement Tax Credit Program and Great Outdoors Colorado. Colorado State University.

⁶² Commonwealth of Virginia. (2016). Calendar year 2016 land preservation tax credit conservation value summary. Accessed on January 27, 2019. Retrieved from: <https://rga.lis.virginia.gov/Published/2017/RD565/PDF>.

⁶³ Ibid.

⁶⁴ Georgia Land Conservation Program. Georgia Conservation Tax Credit. glcp.georgia.gov/georgia-conservation-tax-credit. Accessed on January 28, 2019. Retrieved from: <https://glcp.georgia.gov/georgia-conservation-tax-credit>.

⁶⁵ Commonwealth of Virginia. (2016). Calendar year 2016 land preservation tax credit conservation value summary. Accessed on January 27, 2019. Retrieved from: <https://rga.lis.virginia.gov/Published/2017/RD565/PDF>.

BMP water allocation flexibility

One of the most important environmental concerns in Western states is water-use efficiency. To effectively allocate water rights, states such as Arizona have created Active Management Areas where groundwater has historically been heavily used. These Active Management Areas create management plans that organize how water will be allocated throughout the region and how much water farms receive. The water allotment restrictions provide a framework through which BMPs can be incentivized.⁶⁶



Arizona Active Management Areas

General mechanism

Under the Arizona Active Management Areas, farms receive a certain amount of groundwater per acre that is dependent on their crop(s) and operation type. A farmer can use more or less of that amount and accrue credits or debits as long as she does not surpass a maximum debit amount. However, in some Active Management Areas, farmers can participate in the Best Management Practices Program and forego the allotment process altogether. Instead of being held to maximum groundwater allotments, farmers must implement agricultural conservation practices that include efficient irrigation systems and stringent farm management.⁶⁷ The Arizona Department of Water Resources has provided a list of accepted BMPs that fall into four categories:

- 1) Water conveyance system improvements.
- 2) Farm irrigation systems.
- 3) Irrigation water management practices.
- 4) Agronomic management practices.

A scoring system is used by the state to ensure that farms reach a high level of BMP implementation. The scoring system also requires that a farmer have a minimum score in each of the categories identified above in order to have comprehensive water conservation management.⁶⁸ Category 1 and 2 practices must be put in place before the applicant partakes in the program, after which category 3 and 4 must be implemented on an annual basis once the applicant is enrolled in the program. Farmers can collaborate with other farmers to partake in the BMP Program. As long as the farms are contiguous, farmers can apply as one unit and complement one another's BMPs.

Incentives for water use efficiency BMPs through greater water rights flexibility have been very popular in Arizona. As of 2015, the Pinal Active Management Area BMP program included 80,348 acres of farmland, representing 31% of the region's farmland. However, farms in the BMP program used 45% more water than non-BMP program farms in 2015.⁶⁹ This may be because of many factors, including the types of farms that participate. For example, farms that plant more water-intensive crops may find the BMP program less costly than meeting the allotment requirements and therefore may be more likely to participate in the program. Furthermore, the BMPs implemented by farms may have water quality benefits rather than water quantity benefits. For this reason, it is unclear how successful the agricultural BMP plans have been in reducing water overuse concerns in Arizona.

⁶⁶ Seidl, A., Anderson, D., Bennett, D., Greenwall, A., Menefee, M. (2017). A CSU Study: Investing in Colorado: Colorado's Return on Investments in Conservation Easements: Conservation Easement Tax Credit Program and Great Outdoors Colorado. Colorado State University.

⁶⁷ Arizona Department of Water Resources. Fourth Management Plan: Prescott Active Management Area — 2010-2020. Accessed on February 2, 2019. Retrieved from: <https://new.azwater.gov/ama>.

⁶⁸ Ibid.

⁶⁹ Arizona Department of Water Resources. (2017). Draft Fourth Management Plan: Pinal Active Management Area — 2017. Accessed on February 2, 2019. Retrieved from: <https://new.azwater.gov/ama>.

Cover crop-crop insurance incentives

Crop insurance is frequently described as agriculture's most important risk management tool. Crop insurance protects farmers against losses from droughts, hurricanes, floods, insects, fire and more. In 2017, federal crop insurance policies covered 311 million acres, protecting nearly 90% of the nation's insurable cropland. Insurers backed more than \$106 billion worth of crops in 2017, and farmers paid \$3.7 billion for insurance protection.⁷⁰ Four crops — corn, cotton, soybeans and wheat — typically account for more than 70% of total acres enrolled in crop insurance.⁷¹

The federal government is heavily involved in the crop insurance industry through USDA's Risk Management Agency (RMA), which subsidizes a farmer's premiums and provides reinsurance and administrative reimbursement to private insurers. The federal government also approves insurance providers, sets premium rates, and establishes insurance terms and conditions.⁷²

While RMA maintains a strict regulatory framework for crop insurance, states are permitted to offer an additional crop insurance premium reduction. This is the basis for the Iowa and Illinois cover crop-crop insurance programs.



Iowa Cover Crop-Crop Insurance Demonstration Project

In 2017, the Iowa Department of Agriculture and Land Stewardship (IDALS) created the Cover Crop-Crop Insurance Demonstration Project. The project is set out as a three-year project through which farmers can receive a \$5-per-acre rebate on their crop insurance if they implement cover crops. In order to participate in the program, farmers must abide by the state's cover crop best practices, including seeding dates, seeding rates and seeding mixes. Additionally, the acres that farmers wish to enroll in the program cannot be part of any federal conservation funding programs such as cost share.⁷³ RMA, the federal or state agency that receives crop insurance payments from farmers, still receives their total crop insurance rates on the cover crop fields, but IDALS pays the \$5 benefit for the farmers participating in the program.

The Iowa Cover Crop-Crop Insurance Demonstration Project offers many benefits to the state agency administering the program as well as the farmers who participate. These benefits include a streamlined application process, minimal overhead to manage and integration to the existing crop insurance relationships. Because nearly every Iowa farm participates in crop insurance, this program structure has more opportunity for growth than traditional structures. At the same time, the approach is also more cost-effective for the state. As of early 2019, the Iowa pilot program has received applications for more than 170,000 additional cover crop acres.⁷⁴

In 2019, Illinois announced that it would implement a similar program. The Illinois Department of Agriculture will be adopting and implementing a crop insurance reward program for cover crops called Fall Covers for Spring Savings: Crop Insurance Reward Pilot Program. The program is funded through an appropriation in the Illinois state budget of \$300,000. Similar to the Iowa program, Illinois will also provide \$5 per acre to farmers who adopt cover crops. As with the Iowa program, a coalition of farmers, agricultural organizations and conservation groups developed the program to help meet the goals of the state's nutrient loss reduction strategy.⁷⁵

⁷⁰ Farm Press Staff. February 7, 2018. "Crop insurance acreage, farmers' expense for it up in 2017." Southeast Farm Press. Available at: <http://www.southeastfarmpress.com/insurance/crop-insurance-acreage-farmers-expense-it-2017>.

⁷¹ Shields, Dennis A. August 13, 2015. "Federal Crop Insurance: Background." Congressional Research Service CRS Report. (crop insurance fiscal year cost) <https://www.fas.org/sgp/crs/misc/R40532.pdf>.

⁷² D'Costa, V. (2017). Fertile ground: Revenue will rise as regulatory changes aid industry performance (Agricultural Insurance Industry Report OD4875). Retrieved February 01, 2018, from IBISWorld database.

⁷³ Iowa Department of Agriculture and Land Stewardship. Sep. 2018. Iowa Department of Agriculture and Land Stewardship (IDALS) Cover Crop-Crop Insurance Demonstration Project. Accessed on February 2, 2019. Retrieved from: <https://www.cleanwateriowa.org/covercroppdemo-main/>.

⁷⁴ Opatik, April Ann. "Let Us Celebrate! Illinois Department Of Agriculture Accepts The Crop Insurance Reward Program For Cover Crops!" American Farmland Trust. May 31, 2019. Retrieved from: <https://farmland.org/let-us-celebrate-illinois-department-of-agriculture-accepts-the-crop-insurance-reward-program-for-cover-crops/>.

⁷⁵ Ibid.

Discussion

State agency officials described the strengths of their programs as well as the challenges they face. Key achievements and challenges of each innovative funding source and financing tool were identified through interviews with these officials and the programmatic reports they provided. They are highlighted in table 3 and discussed in more depth below.

Table 3: Successes and challenges of each funding source and financing tool

Funding source/ financing tool	Successes	Challenges
Revolving loan	<ul style="list-style-type: none"> Steady increase in funding Stabilized by federal program Private industry participation 	<ul style="list-style-type: none"> Competition with cost-share Participation slows over time
Environmental double dividend	<ul style="list-style-type: none"> Increase in funding levels 	<ul style="list-style-type: none"> Measuring environmental outcomes of projects
Transferable tax credit	<ul style="list-style-type: none"> Significant levels of funding Cost-effective 	<ul style="list-style-type: none"> Reductions in coverage levels Participation slows over time
BMP water allocation flexibility	<ul style="list-style-type: none"> Providing management flexibility 	<ul style="list-style-type: none"> Measuring environmental outcomes of projects
Cover crop-crop insurance incentive	<ul style="list-style-type: none"> Engaged new allies (crop insurers) in conservation 	<ul style="list-style-type: none"> Too early to tell

Cost-effectiveness

One of the most essential metrics for measuring programmatic success is cost-effectiveness. Innovative agriculture conservation finance programs will typically be compared to existing cost-share models, and must be prepared to show their relative cost-effectiveness. Potential measures include how many conservation practices are funded per taxpayer dollar, environmental impact per taxpayer dollar, and contributions of businesses or farmers relative to the contribution of the state.

Measuring cost-effectiveness can be done with different levels of sophistication, and can sometimes be accomplished in partnership with a university. For example, a 2017 study by Colorado State University on behalf of the state of Colorado estimated a return on investment of \$4-\$12 per dollar invested by the state in the Colorado Conservation Tax Credit Program,⁷⁶ or \$2,700-\$6,600 per acre for an investment of \$500. The final conclusion of the study is that the Colorado Conservation Tax Credit Program is a sound economic investment that returns benefits to the residents of Colorado. This analysis helped inform the legislature about the progress and impact of the program.

Another important consideration when measuring cost-effectiveness is additionality. The level of additionality provided by an incentive program is the amount of new conservation caused by the incentive. In other words, a program is not additional if its funds are used to pay for projects that would be done regardless of whether or not the projects received funding.

⁷⁶ Seidl, A., Anderson, D., Bennett, D., Greenwall, A., Menefee, M. (2017). A CSU Study: Investing in Colorado: Colorado's Return on Investments in Conservation Easements: Conservation Easement Tax Credit Program and Great Outdoors Colorado. Colorado State University.

Measuring environmental outcomes

Another component of measuring the success of a state agricultural conservation program is monitoring environmental outcomes. Environmental targets and measuring procedures should be in place before the inception of a program. Too often, programs are launched without consideration of how to track environmental and economic outcomes. In addition to setting targets, the state must allocate funds and technical expertise toward gathering environmental data, and establish a methodology to calculate environmental outcomes. In most cases, it is cost-prohibitive to directly monitor environmental outcomes, so the program will need a methodology to calculate environmental outcomes based on data that can be collected. The data gathered by the program can inform state policymakers and implementers about the effectiveness of the program in reaching its environmental goals. Continuously gathering environmental data over time also allows the state to adjust its program as environmental concerns are alleviated and others become more prominent.

Consider how the program contributes to behavior change

Those who seek to design a state agriculture conservation finance program should consider how the program plans to change farmer behavior, and tailor the program and financial incentives accordingly. One approach is to incorporate adoption theory. In 1995, Everett Rogers developed adoption theory to explain how innovations expand from small ideas to widespread practice.⁷⁷ Rogers explains that innovation implementation takes five distinct steps:

- **Knowledge** — awareness of the innovation.
- **Persuasion** — forming a positive or negative attitude toward the innovation.
- **Decision** — choice of adoption.
- **Implementation** — incorporating the innovation.
- **Confirmation** — evaluating the decision of implementing the innovation.

Program designers should consider where the farmers they would like to participate currently sit on the adoption curve, and whether the incentive design is likely to encourage them to move further along the curve. For example, one consideration built into the Iowa Cover Crop-Crop Insurance was to develop a program that offers a lower level of financial assistance for farmers who have already exhausted cost-share funding for cover crops. The payment level of \$5 per acre is less than cost-share programs but offers a continued revenue source for farmers who have already incorporated cover crops. The program is particularly useful for farmers who are already implementing the practice, but perhaps have not yet confirmed that they will do so for the long term.⁷⁸

A second important consideration related to adoption theory is whether or not the program's financial incentives address the actual financial barrier preventing farmers from implementing conservation practices. For example, is the barrier to adoption a high upfront cost, an ongoing annual cost, a risk associated with the transition or something else? Will the practice ever create a return on investment for the farmer, or does it provide a purely societal benefit? Are there other behavioral barriers to the change that must be addressed in addition to the financial barrier? If these questions are not answered, programs may be designed that are not addressing the actual obstacle to greater adoption of the practice, and therefore may not attract adequate participation.

⁷⁷ Rogers, E. M. (1995). *Diffusion of Innovations*. New York, USA. The Free Press.

⁷⁸ Lechtenberg, M. Personal communication, 22 August 2019.

Political feasibility

An important measure of political feasibility of a program is the extent to which stakeholders are engaged in the creation and, as importantly, implementation of the program. Many state agencies lack the expertise, funding and personnel required to fully implement a program without engaging stakeholders at some point in the policymaking process. In the preparation of this report, state implementers highlighted the engagement of stakeholders and collaborators at every step in the process as one of the main keys to a program's success. Therefore, stakeholder collaboration and engagement throughout the program design process could provide a useful indication of the political feasibility of a program.

Another important characteristic of successful programs has been the avoidance of political risk when possible. This ensures the durability for programs for the long term, regardless of how the political landscape changes over time or with election cycles.

Programmatic flexibility

Programs that were allowed to evolve with the shifting needs of farmers and conservation efforts were able to effectively address the challenge of low subscription rates. Allowing for flexibility in the types of BMPs covered under a program, for instance, could avoid the issue of saturation, which occurs when BMP adoption has plateaued in a given state. One way to ensure programmatic flexibility is to set a value objective as the main goal of a program, as opposed to the setting of a particular action as the goal of a program. While the latter would result in eventual saturation, the former could potentially be achieved by a number of different actions or practices, which would result in a longer-lived program.

For example, Michigan expanded MAEAP to include farmer education and pesticide recycling. This was possible because Michigan officials define the goal of their program as increasing water quality, rather than the adoption of a specific practice.





Positive interaction with other incentive programs

Incentive programs are only effective when they complement existing incentives. For example, in the case of innovatively financed programs for agricultural conservation, the financial incentives for farmers must consider the other means through which farmers can receive funding for these practices. Many state implementers say that their programs suffer from competition with cost-share programs. State implementers explained that farmers may even wait several years to receive cost-share funding, underscoring that some farmers are willing to wait years in order to receive funding in cash instead of taking out a loan or receiving a tax credit through innovatively financed state programs.

States must therefore provide innovative incentives that are either more attractive, complementary or unique from the traditional cost-share programs — and identify mechanisms for sharing that information broadly. States could also find ways for cost-share programs and innovative incentive programs to supplement one another to provide greater and more diversified funds for farmers.



Conclusion

State-led efforts to innovate in the financing of agricultural conservation offer multiple benefits to farmers, state residents and taxpayers, and society at large. First, these programs provide substantial, direct environmental benefits to residents of the state in the form of improved water quality, reduced agricultural water consumption, increased habitat for wildlife and a more resilient food system. Second, they benefit farmers by supporting them in adopting conservation measures, which is particularly important in the current depressed farm economy. Third, they benefit taxpayers by allowing states to tailor programming to the state's specific needs and increase the cost-effectiveness of conservation dollars. Finally, they benefit society at large by serving as incubators for ideas that can be implemented in other states or at the federal level.

The programs examined in this report still face significant barriers to reaching broad implementation, including competition with cost-share programs and other forms of financing. They address state-specific agriculture conservation issues and are structured in different ways. That said, all states have the opportunity to learn from one another's experiences in order to improve existing programs and develop new programs that address agricultural conservation challenges in useful and cost-effective ways.

Ultimately, NASDA and EDF intend for this report to lead to greater dialogue among states on how to most effectively fund agricultural conservation practices in order to expand their adoption. By providing snapshots of different innovative programs, states can learn from one another's successes and challenges, and in so doing expand the amount and efficacy of state agricultural conservation while ensuring ongoing economic opportunities for farmers.