

Roadmap to Increased Cover Crop Adoption



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Introduction

Cover crops are increasingly utilized by farmers and promoted by agronomists for the multiple benefits they contribute to soil and crop management systems. Yet, only a small percentage of cropland is planted to cover crops. In June of 2012, the National Wildlife Federation brought together 36 of the leading experts in cover crops in the Midwest and Great Plains for a meeting in St. Paul, Minnesota (see appendix for list of participants). These farmers, scientists, extension specialists, and policy experts met for two days to discuss what they saw as the biggest barriers to expanded cover crop adoption and to lay out a “Roadmap” for addressing these barriers in order to achieve our common vision of 100 million acres of cover crops by 2025.

Cover crops are defined in this document as non-commodity crops either inter-seeded into living cash crops or planted onto bare fields during fallow periods to improve soil quality and nutrients available to plants. Within an optimal cropping system, cover crops can increase farm profitability through increased yields, reduced fertilizer costs, and reduced weed management costs. Cover crops retain nutrients that would otherwise leave the field via runoff, leaching, or evaporation, making those nutrients available for the next crop. By keeping soils covered, cover crops significantly reduce nutrient runoff and associated water pollution. Cover crops also remove carbon dioxide from the atmosphere, storing it safely in soils. Finally, cover crops provide habitat and an additional food source for wildlife in the winter because they often continue to grow after the harvest of commodity crops and rejuvenate much sooner in the spring.

Currently, there is no national census or other survey tool that estimates national cover crop adoption. The United States Department of Agriculture (USDA) Conservation Effects Assessment Project (CEAP) estimates that cover crops were used on less than 1% of acres in the Upper Mississippi Basin Region from 2003-2006.¹ Singer et al. surveyed 1096 farmers in Illinois, Indiana, Iowa, and Minnesota on their cover crop use in the fall of 2005, finding that 8% of the farmers planted cover crops that year, while 11% had used cover crops within the previous five years.² Iowa State University Extension surveyed 1360 farmers in 2010 and found that 12% of Iowa farmers planted cover crops within the previous five years.³

The National Wildlife Federation (NWF) has been encouraging the USDA’s National Agriculture Statistics Service (NASS) to collect data on cover crop use. In the absence of this national-level data, NWF has been working to obtain a baseline estimate of cover crop adoption, NWF surveyed cover crop seed dealers. Based on seed sales, NWF estimates that in 2011, at least 1.5 million acres were planted to cover crops in the Mississippi River Basin states of Arkansas, Colorado, Iowa, Illinois, Indiana, Kansas, Kentucky, Michigan, Minnesota, Missouri, Montana, North Dakota, Nebraska, Ohio, Oklahoma, and South Dakota. To put this in perspective, ERS estimates that there are 250 million acres of cropland in those states. Although baseline studies of cover crop adoption are limited, anecdotal evidence suggests that cover crop adoption is increasing, but still quite limited in scope. The objective of this document is to define the barriers to cover crop adoption in the Mississippi River Basin and provide a framework to accelerate adoption in the region.



Gabe Brown

Cover crops are a proven approach which will lower production costs and increase cropping system resilience in the face of climatic challenges.

Vision

By 2025, we envision 100 million acres of cover crops planted across the United States,⁴ and of that, roughly 60 million acres would be in the Mississippi River Basin. A majority of mainstream agricultural producers will understand the agronomic benefits of cover crops, routinely include cover cropping as part of their cropping system and have access to all of the necessary equipment, technology, and knowledge to successfully implement the practice.

Although we expect increasing food demands, rising input costs for food production, and more frequent extreme weather events, cover crops are a proven approach which will lower production costs and increase cropping system resilience in the face of climatic challenges. Maximizing cover crop adoption will be considered a vital component of any comprehensive strategy to address these challenges.

Roadmap

Stakeholders at the Minneapolis conference identified five main categories of barriers and opportunities to increase cover crop adoption: addressing public policy, developing champions, targeting research to farmer needs, increasing availability of key technology, equipment, and seeds, and improving the messaging/outreach on cover crops. This roadmap establishes solutions and action steps to address each of the barriers identified in these main categories, providing an overarching strategy and organizing tool for organizations and individuals working to improve cover crop adoption.

Addressing Public Policy

Public policy can play a key role in promoting cover crop adoption, providing financial incentives to help encourage adoption, and funding for technical assistance, outreach and research. USDA conservation programs, especially the Conservation Stewardship Program and Environmental Quality Incentives Program, have been somewhat successful in helping farmers to adopt cover cropping. Unfortunately, poorly designed public policies can also serve as major barriers to cover crop adoption. Some commodity and risk management programs actually inhibit cover crop adoption by failing to recognize the benefits of cover crops, or by actually discouraging adoption of cover crops due to a lack of understanding of the practice. For example, the Risk Management Agency (RMA), the agency in charge of administering federal crop insurance, might eliminate coverage for farmers using cover crops due to uncertainty over how they impact yield.

There is some concern about the availability and focus of policies designed to increase cover crop use for its conservation value. For example, the Natural Resource Conservation Service (NRCS) ranking system sometimes poorly ranks cover crops for cost-share programs; consequently, they are less likely to receive assistance. Whether through expanded incentives and improved ranking criteria, better research, technical assistance and training of staff, or through redesign of policies that currently punish cover cropping, there is much USDA can do to expand cover crop adoption. Such a goal should become a Department-wide goal, embraced by all the relevant agencies.



Practical Farmers of Iowa

Agency	Policy Barrier to Cover Crop Insurance
Risk Management Agency (RMA)	Some cover cropping practices may result in loss of crop insurance coverage.
Farm Service Agency (FSA)	Some cover crops are considered a fruit or vegetable, so that farmers may forfeit ACRE/DCP payments. Cover crops do not count as fallow in Great Plains and so farmers may lose ACRE/DCP payments.
Natural Resources Conservation Service (NRCS)	Cover crops receive “poor” rank for EQIP funds in some localities, resulting in low eligibility for cost-share incentives.

Actions to Overcome Public Policy Barriers

1. Encourage USDA leadership to develop a department-wide policy and task force to promote cover cropping by developing and compiling needed information, addressing policy barriers and expanding incentives where practical.
2. Develop a list of policy barriers and potential ways to promote cover cropping and approach each relevant government agency or department to address knowledge gaps on the benefits of cover crops and to help them develop a plan for promoting cover crops.
3. Identify which barriers to cover crop adoption require additional analysis or additional research regarding uncertainty on how cover crops impact cash crop performance. One solution might be to submit a concept proposal to the RMA to research the impacts of cover crops on crop yields as part of developing a cover crop endorsement with premium adjustments for those using cover crops.
4. Share the list of barriers and areas for additional research with other stakeholders who are in a position to influence public policies, such as state and federal policy makers. This can be accomplished through congressional briefings or other appropriate venues for policy change. A key strategy to approaching agencies about changing or amending their policies should include explaining cover crops as part of a systems approach to farming.
5. Educate local governments and water agencies, and watershed organizations about the benefits of cover crops and work with them to develop educational outreach to farmers in their areas, as well as to develop incentives for cover cropping, where possible.

Targeting Research to Farmer Needs

Lack of easily applicable information is a common barrier to practice adoption. Many farmers base agronomic decisions upon research data from trials that replicate or closely mimic their own cropping practices and/or crop rotations within their region. Policy makers also rely on research data to develop incentives and risk management tools, as described in the previous section. In the traditional commodity crops, years of research have allowed researchers to advance beyond questions of application to more targeted questions of trait



Ray McCormick

selection. However, research data on cover crop application is falling behind on-farm innovations. More reliable data on how to effectively use cover crops, especially in specific regions, will provide valuable information for farmers deciding how to integrate cover crops into their cropping systems. Research geared toward questions of application or best management practices would also aid policy makers. For farmers, the applied research should provide a decision framework on how to optimally manage cover crops.

The highest priority research questions identified by the conference attendees as limitations to cover crop adoption include:

1. Economic analysis/cost benefit
2. Establishment options (germplasm improvement, seed treatments that delay or quicken emergence and/or improve growth, best practices and equipment for cover crop planting)
3. Impact on commodity crop yield/performance
4. Species selection and combination
5. Environmental impact of cover crops (soil and water conservation impacts; ecosystem services: magnitude and duration)
6. Production system/region/crop rotation-specific agronomic management practices,
7. On-farm data linking cover crops to crop performance,
8. Nutrient retention/cycling/availability

Actions to Meet Research Needs

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1. Determine a host agency/organization and secure funding to employ a research coordinator focused on facilitating relationships and partnerships with federal agencies, universities, and funding organizations to coordinate research efforts to meet the identified needs. An employee of a non-governmental organization would be ideally placed as a facilitator. Someone integrated into government agencies and the university research community, but not employed by these organizations, would be in a good position to facilitate the commission of research and researchers to focus research on farmers' information needs.
2. The research coordinator will initiate research on this list of needs within a reasonable time frame. The research coordinator will be able to track, support, review, and synthesize the results of research, then make sure that important findings are disseminated to farmers and policy makers. The research coordinator could also take steps to implement regional and other targeted projects that best meet farmers' information needs.



Technology and Equipment Availability

Technologies which can be quickly and easily tested by potential adopters are said to have high “trialability.” Farmers will often test new ideas, practices, or equipment in small plots before making a significant commitment to full adoption. For many farmers, a lack of access to equipment such as no-till drills or highboy planters prevents cover crop trials, and thus, cover crop adoption. For example, in the Midwest, many corn-soybean farms could benefit from cover crops, but do not have access to aerial applicators or highboy applicators necessary for interplanting cover crops into standing rows of corn or soybeans. Without easy access to the necessary technology, farmers will not advance to full implementation of cover crops.

Actions to Improve Availability of Key Technology and Equipment

1. Expand equipment rental opportunities through government agencies such as NRCS, or local associations such as land conservation departments or soil and water conservation districts. Historically, these offices or organizations have periodically owned equipment to rent to landowners with the defined purpose of increasing access to specialized equipment to increase the implementation of specific conservation practices. This option would be most appropriate for equipment that most farmers are familiar with, such as a no-till drill, but do not necessarily own such equipment.
2. Farmers will need more expertise to use specialized and technical equipment, such as a highboy air seeder. Custom operators and farm service providers, such as cooperatives, could provide training and access to such equipment. However, these entities usually require a level of demand for this technology before they commit to a purchase. Improving up-front financing - such as loan guarantees, cost-sharing, or incentive payments - would lower the initial cost for custom operators and cooperatives, allowing them to assist early farmer adopters, who lead the way to increased demand.

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Messaging on Cover Crops

Developing compelling messages on cover crop use and impacts is an important step to increasing adoption. Conflicting messages create uncertainty in the minds of farmers and stakeholders who might otherwise support policies and actions to increase their adoption. Some strong, common messages on the impact of cover crops, from agronomic value to water quality benefit, are imperative to gaining support for policy advancements as well as increasing adoption.

The Natural Resource Conservation Service (NRCS) is working on a soil health initiative which creates an opportunity to tie the cover crop message into a concept that is already being promoted in the agricultural community. This presents an opportunity for groups to work together to create one consistent message on the adoption and benefits of cover crops. Region-specific information and messaging can then also be developed from this existing soil health concept. This should be an ongoing process that develops as cover crop research findings become available.

Convincing cover crop farmers, supportive seed dealers and small businesses, NGO's and extension agents to be on the same page in emphasizing the soil health message and other jointly developed messages is a top priority for ensuring consistent communication about the approach and underlying philosophy of cover crops. Also important for messaging would be to have shorter, concise statements on the agronomic, economic, and environmental value of cover crops. These messages would be useful in reaching all audiences, from the halls of Congress to the farm fields and in between. It would also be valuable to develop additional concise statements targeted to particular audiences, or addressing inaccurate information.

In addition to coming up with a common message, marketing that message is another key priority to help move towards increased adoption. Therefore, we must develop a marketing strategy that targets multiple audiences.

Actions to Achieve Common Messaging on Cover Crops

1. Identify conflicting messages within the agricultural community and develop counterarguments. Such as:
 - a. One assumption holding back cover crops is that it is "an oddball practice." Changing this perception by highlighting its growing use by "mainstream" producers would help change that perception/assumption.
 - b. Research provides conflicting information on the best management practices, and appropriate cover crop species to use. Farmers and crop advisors could process the research more efficiently if the underlying philosophy of cover crops is clarified and emphasized. This philosophy is that:
 - i. Soil health is critical for healthy crops and long-term productivity.
 - ii. Covers crops help build soil organic matter, which is perhaps the best indicator of soil health and productivity.
2. Get agronomists, crop advisors, and others to communicate using common messages on cover crops (in order to avoid sending conflicting information to farmers).
 - a. Establish continuing education credits/ or a cover crop certification system (either through Soil and Water Conservation Society or American Society of Agronomy). This would employ the underlying philosophy mentioned above and would ensure that crop advisors and agronomists thoroughly understand cover crops, their management and implementation, and their agronomic impacts so they may provide consistent and justified agronomic advice to farmers.
 - b. Establish a library of information to help cover crop supporters quickly find talking points, information, and research data to refute inaccurate claims against cover crops, clarify questions of uncertainty, or further educate farmers and agricultural industry leaders on cover crops.
 - i. This information would target four main audiences:
 1. Farmers
 2. Landowners who lease their land to farmers
 3. Policy makers and the general public
 4. Agronomists who advise farmers on practices
 - ii. Topics to cover in this library:
 1. Nutrient management
 2. Environmental impact
 3. Risk mitigation
 - a. Increased water holding capacity (helps crops survive through droughts)
 - b. Increased percolation (helps crops survive through periods of excess moisture)
 - iii. Information format (targeting each audience)
 1. Fact Sheets
 2. Short Videos (news-like segments, presentations, or blogs)
 3. Compiled research
 - c. Solidify information on the marketable value of cover crops:
 - i. Healthier soils/environmental impact
 - ii. Higher Nutrient density (a long-term/high-risk/reward concept)



Developing Cover Crop Champions

While the other categories of opportunities to accelerate adoption involve overcoming barriers, cover crop champions are a unique resource to help increase cover crop adoption, as they are a driving force behind widespread cover crop use in particular geographic areas. Adoption of cover crops is often greatly enhanced in a region by highly successful and innovative farmers, or “champions” with a passion for sharing the secrets to their success with others. Cover crop adoption increases in geographic areas surrounding cover crop champions often because the initial presence of these early adopters results in access to infrastructure/equipment/knowledge that make such tools more accessible for other farmers. Areas lacking local cover crop champions will experience heightened difficulty in establishing a critical mass of farmers planting cover crops. Therefore, supporting cover crop champions is an important strategy for increasing cover crop adoption and a vital tool in breaking down many barriers.

Description of Champion Pairs

At the June 2012 cover crop roadmap meeting in Minneapolis, a working group developed around this theme. That group envisioned two types of cover crop champions: highly successful farmers who use cover crops and other soil health practices, and agricultural professionals who are full time employees of a farm-related organization (for example, Farm Bureau, NRCS, or Practical Farmers of Iowa). These two types, farmers and agricultural professionals, may be more effective when they work together in pairs than they are individually. In this document, these two types are referred to as “farmer champions” and “educator champions”. Both types should possess certain key traits, and both have a distinct role.

The role of the educator champion includes cultivating new farmer champions and supporting current farmer champions by making it easier for the farmer champion to deliver presentations and provide technical assistance. The educator champion can do this by coaching the farmer champion in basic presentation skills and providing information and data that farmer champions may use on the farm or in outreach efforts. The educator champion can also identify key opportunities for farmer champions to share their expertise. The educator champion makes time to visit with experienced and beginning cover cropping farmers, sharing and distributing information from various farmers. The educator champions will carry their mission forward over the course of years, finding opportunities to incorporate cover crops and soil health into various foundation, non-profit and government initiatives and programs whenever it is beneficial and appropriate.

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Practical Farmers of Iowa

As these individuals will be spokespeople for cover crops, farmer champions must be economically and socially successful, and have soil health as a primary mission. Examples of successful farmer champions might include Barry Fisher and Dan DeSutter of Indiana, and Jay Fuhrer and Gabe Brown of North Dakota. The farmer champion's role includes traveling around the region and delivering presentations about cover crops and soil health. It may also include hosting several field days at his or her farm. The farmer champion will also work with the educator champion to answer follow-up questions by phone and email from interested farmers. It is important that farmer champions are supported, but not overextended, in their efforts to share their expertise and enthusiasm.

By raising the profile of cover crops and increasing the amount of resources allocated to cover crops and soil health in their state or region, champions will bring along other educators, farmers or regional hubs that can provide more localized technical assistance. Cover crop champions will benefit from interacting with each other. These interactions help generate and spread innovative new ideas, keep champions motivated and excited, and produce a sense of community amongst like-minded people.

Actions to Support Cover Crop Champions

1. Identify full time employment for educator champions; providing each with a platform for carrying out cover crop education.
2. Provide consistent funding and travel assistance to farmer champions to assist them in sharing their expertise at events and in technical assistance follow-up.
3. Develop a package of tools that cover crop champions need for on-farm demonstrations and meetings. This will include a physical 'kit' for demonstrations, and a written 'protocol' for how to run an effective meeting.
4. Plan an annual week-long "roadshow" for the cover crop champions to share their expertise across their state.
5. Bring together cover crop champions from multiple states annually at an already existing meeting like the Midwest Cover Crop Council Conference, the No-Till on the Plains conference, or the Green Lands Blue Waters meeting.
6. Provide cover crop champions with financial assistance for travel and incidentals as they carry out activities to promote the practice.



Goals and Milestones: Evaluating Successful Implementation of the Roadmap

Long-term Goal: By 2025, 100 million acres of cover crops are planted in the United States.

Intermediate Goal: By 2015, 10 million acres of cover crops are planted in the Mississippi River Basin.

At this time, there is no national farm survey that has measured cover crop acreage across the US; therefore, in order to track the success of this roadmap in encouraging adoption of cover crops, an accurate and consistent means to track cover crop use is necessary. Annual farm surveys and acreage reports, within the existing framework of data at USDA, present a well-developed measurement tool that may be amended to include measurement of cover crop use.

With accurate and robust tracking of cover crop use, we may track progress toward the following quantitative goals:

1. By 2015: cover crops are used on 5 percent of harvested row crop acres in the Mississippi River Basin, roughly 10 million acres.
2. By 2025: cover crops are used on 25 percent of harvested row crop acres in the Mississippi River Basin, roughly 50 million acres.
3. By 2025: cover crops are used on 30% of harvested row

crop acres across the United States, roughly 100 million acres.

The following list of indicators does not provide direct quantifiable metrics for cover crop adoption; rather, these qualitative milestones will indirectly indicate that efforts to increase cover crop awareness and adoption are achieving success.

1. Private industry will expand cover crop products and related services to meet the growing farmer/landowner demand.
2. Landlords will routinely request that farmer tenants use cover crops to improve soil health as a way of preventing degradation of land productivity or even increasing the value of their land.
3. Published scientific literature will include more results reported from on-farm cover crop research.

This document is meant to be a catalyst for actions toward overcoming the barriers and supporting the champions of cover crop adoption. The roadmap represents collaboration among many stakeholders, and is freely available as a planning tool to any organization or individual interested in promoting cover crop adoption.

For questions please contact:

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Appendix: Attendee List for Minneapolis Conference on Building the Cover Crop Roadmap

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Mike Baise, American Farmland Trust
Don Baloun, Natural Resources Conservation Service
Keith Berns, Green Cover Seed
Rich Biske, The Nature Conservancy
Eliav Bitan, National Wildlife Federation
Tracy Blackmer, Ph.D., Iowa Soybean Association
Gabe Brown, Brown Ranch
Lara Bryant, National Wildlife Federation
Sarah Carlson, Practical Farmers of Iowa
Jeff Curran, LaCrosse Forage and Turf
Dave Degeus, The Nature Conservancy
Dan DeSutter, Farmer
Barry Fisher, Indiana Natural Resources Conservation Service
Dennis Fuchs, Stearns County Soil and Water Conservation District - National Association of Conservation Districts
Steve Groff, Cover Crop Solutions
Noel Gurwick, Ph.D., Smithsonian Environmental Research Center
Linda Hennen, Farm Service Agency
Chuck Kearny, LaCrosse Forage and Turf
Bruce Knight, Strategic Conservation Solutions
Brain Lindley, No-Till on the Plains
Jana Lindley, No-Till on the Plains
Sasha Lyutse, Natural Resources Defense Council
Joseph McIntyre, Ag Innovations Network (Facilitator)
Steve Mirsky, Ph.D., United States Department of Agriculture, Agricultural Research Service
Paul Mitchell, Ph.D., University of Wisconsin
Jon Mohn, LaCrosse Forage and Turf
Bob Olson, Cooperative Development Services
Jerry Peckumn, Farmer
Dave Robison, Legacy Seeds
Julie Sibbing, National Wildlife Federation
Ryan Stockwell, Ph.D., National Wildlife Federation
Alan Sundermeier, Ohio State University
Dan Towery, Ag Conservation Solutions
Richard Warner, Green Lands Blue Waters
Norm Widman, Natural Resources Conservation Service

Endnotes

¹ Conservation Effects Assessment Project, *Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Upper Mississippi River Basin* (United States Department of Agriculture, Natural Resources Conservation Service, July 2012), http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1042093.pdf.

² J. W. Singer, S. M. Nusser, and C. J. Alf, "Are Cover Crops Being Used in the US Corn Belt?," *Journal of Soil and Water Conservation* 62, no. 5 (September 1, 2007): 353–358.

³ J.G. Arbuckle and J. Ferrell, "Attitudes Toward Cover Crops in Iowa: Benefits and Barriers" (Iowa State University Extension and Outreach, March 2012), <http://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2012-03-attitudes-toward-cover-crops-iowa-benefits-and-barriers.pdf>.

⁴ The 2007 National Resources Inventory by USDA estimates that there are 357 million acres of total cropland in the United States.