A PERSPECTIVE ON AGRICULTURAL POLICY IN THE AGE OF NUTRIENT LOSS

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I. INTRODUCTION

The controversial Des Moines Water Works lawsuit has sharpened the edges of the rural-urban divide and raised difficult questions about nutrient loss.[1] The loss of nutrients from farm fields that degrade water quality creates an inherently complicated issue with significant challenges for farmers, communities, companies, consumers, and policymakers. Des Moines Water Works, a large municipal drinking water supplier in the heart of the Corn Belt, sued farmland drainage districts which brought the issue to a head.[2]

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1. This Essay is primarily adapted from two recent works by the author, as well as from a panel presentation at the American Agricultural Law Association's 38th Annual Agricultural Law Symposium in Louisville, Kentucky (October 26-28, 2017). The first is a law review article published as part of a paper symposium by the University of Arkansas at Little Rock Law Review. *See* Jonathan Coppess, *A Return to the Crossroads: Farming, Nutrient Loss, and Conservation*, 39 U. ARK. LITTLE ROCK L. REV. 351, 351 (2017) [hereinafter Coppess, *A Return to the Crossroads*]. The second is a forthcoming book on the history and development of American farm policy. *See* JONATHAN COPPESS, THE FAULT LINES OF FARM POLICY: A LEGISLATIVE AND POLITICAL HISTORY OF THE FARM BILL (forthcoming 2018) [hereinafter COPPESS, THE FAULT LINES OF FARM POLICY].

2. *See generally* Bd. of Water Works Trs. v. Sac Cty. Bd. of Supervisors, 890 N.W.2d

From an academic standpoint, the Des Moines Water Works lawsuit was dismissed without resolving novel questions about the application of the Clean Water Act to agriculture.[3] This highlights that the regulatory system may be inadequate, and the courtroom no more likely to provide an appropriate arena, for addressing an issue that affects both rural and urban dwellers. For example, farmers lose when nutrients intended to grow crops for food and fuel are lost to waters flowing out of the field. Citizens lose when they have to pay to remove those lost nutrients from the water they drink. The challenge presented by nutrient loss is as vast and complex as any human interaction with nature; it is a tangled project to meet the demands for food without degrading the natural resources that are just as vital to human existence. If ever there were an issue demanding creative policy solutions, nutrient loss is it.

To reiterate, the traditional system of regulation may be ill-suited for the challenge of finding a solution for nutrient loss. The Clean Water Act is at the core of federal law for water quality[4] but concerns itself primarily with point sources of pollution—the "discernable, confined and discrete" conveyances of pollutants to waters by human activities.[5] The diffuse discharges that cause nutrient loss are generally beyond human control, produced from the combination of storms, plant growth, and farming.[6] They are also generally beyond the reach of the statute's regulatory focus.[7] Farm nutrient loss and the Des Moines Water Works lawsuit illustrate this challenge.[8] The scale and scope is immense, spanning to far-off hypoxic zones but also relevant in our own communities.

Consider that the most important factor in the loss of nutrients from farming is also one of the most significant risks to farm production—the weather.[9] Farmers

50 (Iowa 2017).

3. *See generally id*. (The court instead considered procedural issues such as Article III standing, Equal Protection, Due Process, and Takings claims. The court eventually held that the defendants did not have standing and the last three claims were not considered).

4. 33 U.S.C. § 1251(a) (2012).

5. 33 U.S.C. § 1362(14) (2012) (A point source is "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch . . . does not include agricultural stormwater discharges or return flows from irrigated agriculture."); s*ee also* Decker v. Nw. Envtl. Def. Ctr., 568 U.S. 597, 622-23 (2013) (Scalia, J., concurring in part and dissenting in part) (asking "are storm water discharges 'natural runoff' when they are channeled through manmade pipes and ditches, and carry with them manmade pollutants . . . ?").

6. *See* Mahdi Al Kaisi, *Heavy Rain, Soil Erosion and Nutrient Losses*, IOWA ST. U. EXTENSION & OUTREACH, (June 5, 2008), https://perma.cc/T24S-AZCC.

7. *See generally* 33 U.S.C. § 1311 (2012).

8. *See* MacKenzie Elmer, *Des Moines Water Works Won't Appeal Lawsuit*, DES MOINES REG. (Apr. 11, 2017, 5:54 PM), https://perma.cc/YCP5-Y58M.

9. *See* Coppess, *A Return to the Crossroads*, *supra* note 1, at 356-57.

apply nutrients to feed crops but rain makes all the difference in whether those nutrients serve their intended purpose. Rainwater can export nutrients from the field before crops have a chance to use them.[10] Rain, or the lack of it, can also impact a crop's ability to use what has been applied, leaving behind residual nutrients vulnerable to export.[11] Certainly, farming practices have a vital role in nutrient loss because a farmer manages important aspects of the field, water, crop, and nutrients applied. A farmer's role, however, is complicated by uncontrollable weather and a long legacy of human efforts to drain fertile lands for farming and health-related purposes. These realities offer little for effective regulatory efforts and even less for individualized litigation. If law in general, and agricultural law in particular, are to have any real impact on this issue, it will be in contributing to the development of sound, effective policies that concentrate on these interconnected strands: weather, natural resources, market and economic risks that are critical to farmers.

At its best, policymaking is the concentrated effort of a large, diverse society working out difficult, complex problems. Due to conflicting interests, this effort necessarily involves competition among varied parties and the decisions by representatives in a legislative body.[12] In short, successfully crafting policies can represent achievements in self-government—achievements within the "circumstances of politics" that can be as befuddling as impressive.[13] Policymaking is where challenges produce policies that are transformed into law via the alchemy of the constitutional process. The process drives creativity and demands compromise as interests form coalitions in the search for votes. As the most direct federal link to the fields where nutrients are being lost, federal farm policies contained in the Farm Bill also provide the best vehicle for addressing farming's nutrient loss challenge. Success, however, will not be a simple task.

Throughout the long history of American farm policy—over eighty years, with more than twenty reauthorizations (and counting)—the overwhelming priority has been to counter low crop prices in the bottom lines of producers for a select category of bulk, storable commodities.[14] That history has produced notable instances where natural resource concerns and farm economic concerns converged to produce substantive changes.[15] For example, economic catastrophe in the Great Depression converged with the soil erosion disaster of the Dust Bowl to produce

10. Kaisi, *supra* note 6.

11. Coppess, *A Return to the Crossroads*, *supra* note 1, at 356-57.

12. *See* Jeremy Waldron, *The Dignity of Legislation*, 54 MD. L. REV. 633, 640 (1995).

13. *See id.*

14. *See* Coppess, *A Return to the Crossroads*, *supra* note 1, at 366-69. *See generally* COPPESS, THE FAULT LINES OF FARM POLICY, *supra* note 1.

15. *See* Coppess, *A Return to the Crossroads*, *supra* note 1, at 351.

landmark policy in the New Deal era of the 1930s. Expansionary efforts and policies in the 1970s contributed to a second round of economic crisis and natural resource problems, which resulted in landmark legislation for both farmers and conservation in 1985.[16] This Essay proposes that the current acreage expansion under the influence of renewable fuel production has coupled with technological advances in seeds, chemicals, equipment, and management to contribute to record harvests, relatively lower crop prices, and increased economic stress, while also leaking nutrients in substantial quantities. If entrenched interests can see beyond narrow, short-term outcomes and overcome the habit of protecting favored programs, the current era could reap landmark legislative achievements that benefit farmers and the environment.

II. COVER CROPS

There are no panaceas in policy, nor in the natural world where humans interact with each other and the environment; perfect outcomes remain unattainable. We are engaged, rather, in a perfecting process forged out of the opportunities presented by various problems, challenges, and issues. It is, more often than not, a process that involves innovation through the lessons learned from trial and error. If there are any silver linings in the nutrient loss challenge and the Des Moines Water Works lawsuit, they highlight important shortcomings in our policies and our production practices. What has been exposed, more importantly, are opportunities to catalyze innovation and make advancements through perfecting efforts. It would be difficult to find a single example that better encapsulates all of this—connecting nutrient loss, farming, and federal policy—than that of cover crops.

The term cover crop is a partial misnomer. Cover cropping is a conservation and soil health practice, not commercial crop production.[17] Cover crops are grown within the commercial crop rotation during the normally-fallow months between cash crops.[18] A farmer will plant a cover crop around the time that the commercial crop is harvested, although some will broadcast the seed into the standing commercial crop.[19] Some cover crops do not survive the significantly low temperatures

16. *Id*. at 369-71; Linda A. Malone, *A Historical Essay on the Conservation Provisions of the 1985 Farm Bill: Sodbusting, Swampbusting, and the Conservation Reserve*, 24 U. KAN. L. REV. 577, 581-82 (1986). *See generally* COPPESS, THE FAULT LINES OF FARM POLICY, *supra* note 1.

17. Peter Lehner & Nathan A. Rosenberg, *Legal Pathways to Carbon-Neutral Agriculture*, 47 ENVTL. L. REP. 10845, 10850-51 (2017).

18. *See, e.g.*, Jason S. Bergtold et al., *A Review of Economic Considerations for Cover Crops as a Conservation Practice*, RENEWABLE AGRIC. & FOOD SYS., Apr. 25, 2017, at 1, 1.

19. *See What You Need to Know About Broadcasting Cover Crops*, WALLACESFARMER (Feb. 8, 2016), https://perma.cc/9LZ6-4EAL.

of the winter months, but others survive in a dormant stage and resume growth when temperatures begin to warm in late winter and early spring.[20] Typically, an over-wintering cover crop will be terminated by a farmer in the spring to allow for planting the commercial crop.[21]

Although not a commercial crop, the general consensus from research and experience is that cover crops have the potential to benefit commercial crop production, in part by conserving natural resources.[22] Specifically, adopting cover crops may improve the overall health of the soils and enhance soil fertility, including by protecting them from weather and reducing erosion.[23]

Cover crop practices are not, however, new to farming, nor are they a novel concept untried and untested outside of a laboratory setting.[24] Farmers have long known the value of vegetative cover in cultivated fields.[25] As a farm practice, cover cropping dates back to Roman times with the most significant push for it in the U.S. coming during the Dust Bowl in the mid-1930s.[26] The practice of cover cropping was largely abandoned after World War II with the widespread advancement and adoption of synthetic fertilizers and chemical inputs; matters of soil health, fertility, and productivity were effectively outsourced to synthetics and genetics in

20. Brian Barth, *How to Grow a Cover Crop This Fall*, MOD. FARMER (Aug. 12, 2015) https://perma.cc/3QYA-VFTY.

21. *See* Jill Sackett Eberhart, *Spring Management of Cover Crops*, U. MINN. EXTENSION, https://perma.cc/B4Q6-QBVZ (archived Apr. 11, 2018).

22. *See Cover Crops*, U.C. DAVIS, https://perma.cc/VLD2-G4DS (archived Apr. 11, 2018).

23. Bergtold et al., *supra* note 18, at 6-7, 9-10 ("[h]igher cash-crop yields may be possible for some cover crops" and "[c]over crops slow erosion by providing physical cover that protects soil from rain and wind . . . can also increase [soil organic matter] . . . increases soil aggregation . . . improving aeration, rainwater infiltration and water-holding capacity . . . [i]mproved soil health leads to increased soil productivity and improved cash-crop performance" over the long-term); Richard T. Roth et al., *A Cost Analysis Approach to Valuing Cover Crop Environmental and Nitrogen Cycling Benefits: A Central Illinois on Farm Case Study*, 159 AGRIC. SYS. 69, 69 (2018) ("Cover crops provide soil erosion control, improved soil tilth, increased soil organic matter, increased water-holding capacity, and a medium for improved overall soil fertility."); *see* G.S. Marcillo & F.E. Miguez, *Corn Yield Response to Winter Cover Crops: An Updated Meta-Analysis*, 72 J. SOIL & WATER CONSERVATION 226, 226, 236 (2017).

24. *Cover Crops*, *supra* note 22.

25. *Id.*

26. Mike Dunn et al., *Perceptions and Use of Cover Crops Among Early Adopters: Findings from a National Survey*, 71 J. SOIL & WATER CONSERVATION 29, 29 (2016); *see* Bergtold et al., *supra* note 18, at 9 (citing WALTER V. KELL & ROLAND MCKEE, U.S. DEPT. OF AGRIC., FARMER'S BULL. NO. 1758, COVER CROPS FOR SOIL CONSERVATION (1936)).

agriculture's technological revolution.[27] The practice has resurfaced in recent years in response to concerns about soil health and the push to reduce nutrient losses from farm fields.[28]

III. COVER CROPS AND NUTRIENT LOSSES

The potential for cover crop adoption to reduce nutrient losses is substantial because plants growing during the traditionally fallow months coincide with the time of year when the vast majority of nutrients are being lost from farm fields.[29] This is especially true in the case of winter cover crops that resume growth during the thaw and rain of early spring before any commercial crop is growing in the field to consume those nutrients.[30] The growing vegetative cover not only protects soil from erosion, it also consumes residual nutrients that would otherwise be vulnerable to losses from precipitation events.[31] These plants scavenge nutrients, especially nitrogen, and store them in the plant biomass after termination, thereby effectively reducing nutrient loading in drainage water by decreasing the amount leached into subsurface tiles.[32] While research has largely borne this out, it is also intuitive: growing plants need the nitrogen and other nutrients available in soils.[33] If the soils are fallow and contain no growing plants, the nutrients in those soils are susceptible to leaching when water drains to subsurface tiles or runs off of the surface with rain or melting snow.[34]

Unique among conservation practices, cover cropping can reduce nutrient loss without interfering with commercial crop production.[35] It is a practice with substantial flexibility, as well as, unlimited opportunities for innovation and the trial-and-error method so common in agriculture.[36] More to the point, typical edge-

27. ROLAND BUNCH, CANADIAN FOODGRAINS BANK, RESTORING THE SOIL 5 (2012), http://www.fao.org/ag/ca/ca-publications/restoring_the_soil.pdf.

28. *See* Marcillo & Miguez, *supra* note 23, at 226.

29. Coppess, *A Return to the Crossroads*, *supra* note 1, at 384.

30. *See id.*

31. *See generally* Roth et al., *supra* note 23.

32. *See, e.g.*, Corey Lacy & Shalamar Armstrong, *The Efficacy of Winter Cover Crops to Stabilize Soil Inorganic Nitrogen After Fall-Applied Anhydrous Ammonia*, 44 J. ENVTL. QUALITY 442, 442 (2015).

33. *See generally* Roth et al., *supra* note 23.

34. *See generally* J. Lehmann & G. Schroth, *Nutrient Leaching*, *in* TREES, CROPS & SOIL FERTILITY: CONCEPTS AND RESEARCH METHODS (Schroth & Sinclair eds., 2003), http://www.css.cornell.edu/faculty/lehmann/publ/Lehmann%20et%20al.,%202003,%20Leaching%20CABI%20book.pdf.

35. *See* Dunn et al., *supra* note 26, at 38.

36. *See id.* (discussing the trial-and-error nature of adopting cover crops and the importance of learning from experience).

of-field practices require longer-term commitments and may remove some portion of the field from production. Reserve, retirement, or easements require even longer-term commitments and can take entire fields out of farming. By comparison, cover crops are an in-field practice that can be integrated into existing cropping systems and tailored by a farmer to meet his or her comfort level and management needs, requiring only a short-term commitment that does not necessitate the removal of acres from production.[37] Cover crops might also provide an effective nitrogen storage mechanism in plant biomass that will return some of the scavenged nitrogen to the growing cash crop instead of it leaching to the tiles or being lost to the atmosphere.[38]

IV. RISKS OF COVER CROPS

It may be necessary, however, to provide a reminder that there are no panaceas and that cover cropping is not a cure all practice.[39] In fact, farmers have been slow to adopt the practice; adoption has been concentrated with innovative farmers willing to absorb the costs and invest in the trial-and-error process.[40] Cover crop acreage has increased in recent years, but the practice remains in use on only a fraction of the total acres planted.[41] Despite the benefits the practice provides, significant barriers to its widespread adoption remain.

37. *See, e.g.*, Roth et al., *supra* note 23, at 70.

38. *Id.* at 70, 72 (Cover crops save nitrogen "that would have otherwise leached below the root zone or lost to the atmosphere through denitrification with constructed wetlands, woodchip bioreactors or two-stage ditches." The study found that, depending on when the farmer terminates an overwintering cover crop, it is possible that as much as 95% of the nitrogen consumed by the cover crop will be returned to the soil and available to the growing commercial crop.); Bergtold et al., *supra* note 18, at 8 (cover crops "can 'scavenge' for nutrients that have leached to the lower part of the root zone, rescuing potential lost nutrients" and serving as a "recycling mechanism" through the "gradual breakdown process" that can take place during the "period of active nutrient uptake" by the cash crop, "meaning that cash crops have steady access to vital nutrients for a longer period" of time in the growing season, but that much remains unknown about this process and how much is returned or when); Marcillo & Miguez, *supra* note 23, at 236 (cover crops, depending on seed mixture, can improve corn yields and establish legumes that remove nitrogen from the atmosphere).

39. *See generally* Bergtold et al., *supra* note 18 (emphasizing it is "just one part of a well-rounded conservation plan or system").

40. *See* Mike Dunn et al., *supra* note 26, at 35; Roth et al., *supra* note 23, at 70 (citing CONSERVATION TECH. INFO. CTR., COVER CROP SURVEY (2016), http://www.ctrc.org/media/covercrops/2016CoverCropSurvey_Final.pdf).

41. The 2012 Census of Agriculture indicated cover crops on just 2.9% of cropland acres. *See* Maria Bowman et al., *An Economic Perspective on Soil Health*, USDA (Sept. 6, 2016), https://perma.cc/4T8P-LQQX.

Risk permeates agricultural production and managing risk is a dominate feature of farming. It is a matter farmers are very familiar with, but which they are unlikely to seek more of. Adopting cover crops can add risk and management complexities to farming operations, particularly during crucial windows for planting the cash crop in the spring.[42] In the extreme case, if a farmer is unable to terminate the cover crop in spring in order to permit timely planting, then the entire cash crop for that year is in jeopardy and so is the farm.[43] Even with research indicating that cover crops can benefit the soil and water, questions remain about the impact on yields and growing conditions within the crop year. These are complex matters much of which are very dependent upon location, weather, and management decisions by farmers. Without further research and demonstration regarding the many practical questions and issues farmers have about cover crops, adoption of the practice is likely to remain the province of innovators willing to take the time and make the investment to learn slowly through experience.[44]

These risks—to planting, yields, and farm management—are ultimately

42. Bergtold et al., *supra* note 18, at 2-6 ("[C]ompatibility with a producer's current farming system and other limiting factors . . . careful planning is required to avoid encroachment on cash-crop responsibilities . . . require the producer to actively manage the cropping systems on a year-round basis" including the potential that the cover crop serves as "hosts for diseases or pests.").

43. *Id.*; *see* Dunn et al., *supra* note 26, at 35 (discussing perceptions that cover crops "make planting more difficult and that they are tough to terminate" in time to plant the cash crop).

44. *See, e.g.*, Dunn et al., *supra* note 26, at 35-38. Cover crops may also raise questions about the national agricultural research agenda, both in terms of basic research on many technical questions, as well as the applied research and demonstration necessary to translate research findings in labs to the fields and farmers. Part of this could be due to the fact cover crops can be an odd fit. For example, engineers are likely to want to focus on edge-of-field practices that require design and building, such as bioreactors or constructed wetlands. Similarly, a crop scientist may recoil at researching a plant that is to be chemically terminated before ever producing a harvested crop. This is not to insinuate research is not being done, but rather much more is needed—particularly in terms of application and demonstration, soil science, agronomy, and economics. These questions are mirrored and potentially magnified by ones about the market and supply chain. For example, input companies are unlikely to invest in research and development on cover crops if the focus remains on cash crop genetics that match specific synthetic chemicals in a singular quest for yield increases.

about economics.[45] Farmers adopting cover crops are adding costs to their operations.[46] Establishing the cover crop involves the cost of the seed and the method of planting it, such as drilling, aerial seeding or broadcast seeding.[47] The growing cover crop must also be terminated in the spring in order to plant the cash crop, likely adding cost for chemical or mechanical termination.[48] In addition to these basic costs, the cover crop may impact fertilizer application needs and could impact yields, depending on how a farmer manages the cover crop and the cash crop rotation.[49] In an extremely competitive business environment with often-tight margins, adding costs through the adoption of cover crop practices will put a farmer at a significant competitive disadvantage with those farmers who do not adopt the practice, unless adopting it can benefit farmers' bottom lines.[50] The challenge is increased if the benefits of cover cropping do not align with the costs. Improvements in yield and profitability from better soil health due to cover crops are long-term investments that require multiple years of sunk costs to achieve.[51]

Additional risk and management complexity combines with these additional

45. *See* Jason S. Bergtold et al., *supra* note 18 ("[R]isk is predominantly encountered within the context of economic performance . . . ."); Roth et al., *supra* note 23, at 70 ("[T]op barriers to [cover crop] adoption amongst producers. . . were the costs of planting and managing the [cover crop], the cost of the [cover crop] seed itself, and the lack of measurable economic returns . . . ."); *see also* Dunn et al., *supra* note 26, at 38 ("[T]hose producers who perceive cover crops use within their locality to threaten profitability. . . or complicate farm management. . . are less likely to adopt the practice if they must rely solely on their own funds to do so.").

46. Coppess, *A Return to the Crossroads*, *supra* note 1, at 385 (citing sources for estimated per acre costs on cover crops ranging from $20.60 to $115.15 per acre).

47. Roth et al., *supra* note 23, at 70.

48. *Id*.

49. *Id*. at 70-71.

50. *See* Dunn et al., *supra* note 26, at 30 ("[P]roducers with a business mindset expressed interest in adopting conservation practices during periods when funding is most easily attainable or when a practice was expected to result in increased profits."); *see also* Bergtold et al., *supra* note 18 ("[C]over-crop profitability is solely dependent upon increasing cash-crop revenues via higher yields.").

51. Mike Dunn et al., *supra* note 26, at 30, 38 ("The practices often require a long-term investment while providing little or no short-term benefits."); *see* Bergtold et al., *supra* note 18, at 1-2, 6-7 ("Cover crops, like any investment may not provide immediate net returns" requiring multiple growing seasons with the practice to "maximize the benefits received from heavy residue covers and increased [soil organic matter]." "Improved soil health leads to increased soil productivity and improved cash-crop performance [over the long-term]."); Bowman et al., *supra* note 41 ("Another factor that may influence a farmer's decision to implement soil health practices is the time lag required to achieve improvements in soil health. Often the costs of adopting a practice happen in years (for example, buying cover crop seed), whereas improvements in soil health build slowly over time.").

costs to put the innovative farmer at a competitive disadvantage. Moreover, the benefits of cover cropping for a farmer, in terms of soil health and yield, can take many years to accrue, but might not be sufficient on their own. While the practice has significant and more immediate benefits to society in terms of reduced nitrogen losses to the air and water, there is no market or similar incentive to a farmer for providing those societal benefits.[52]

V. POLICY PRIORITIES

These factors produce serious barriers to widespread cover crop adoption, but they also make the case for those achievements within policy. Direct assistance to a farmer for adopting the practice is the policy priority, but researchers tend to counsel a broader focus that extends beyond increasing yields and profits.[53] Of particular importance in crafting policy is flexibility and adaptability, given the near-constant changes in conditions and circumstances in the field.[54] In addition, policies will likely need to be applicable to large commercial farming operations in the most productive regions of the country and directly relevant to modern farmers on the issues they face, such as the challenges surrounding practice adoption on rented land.[55]

Reviewing the current federal policy landscape through the lens of nutrient

52. Bergtold et al., *supra* note 18, at 9 ("[C]over crops may be able to provide a reduction in long-term risks if continual use results in a stabilization of cash-crop yields" but "there are not established markets for cover-crop benefits that accrue to society.").

53. *See* Dunn et al., *supra* note 26, at 30 ("[S]ubsidies for conservation on working farmland are likely to result in a substantial increase in practice use."); *see also* Bergtold et al., *supra* note 18, at 10, 11 ("Subsidy programs may be very important for promoting cover crop adoption" and citing research that cost-share assistance "would increase both the likelihood of farmers adopting and the proportion of land on which cover crops are used."); Gabrielle E. Roesch-McNally et al., *The Trouble with Cover Crops: Farmers' Experiences with Overcoming Barriers to Adoption*, RENEWABLE AGRIC. & FOOD SYS., Feb. 8, 2017, at 1, 9 (2017) ("In order to facilitate greater adoption of cover crops, more efforts should be made to assist farmers in integrating them into their current production system or find viable ways to modify production systems in order to facilitate greater crop use. . . These efforts may require changes to policies that can reduce structural barriers to adoption.").

54. *See* Marcillo & Miguez, *supra* note 23, at 236 ("Incentives for [cover crop] adoption should also consider factors beyond expectations for yield increases, such as improvements in nutrient cycling, water conservation, and erosion control."); Bergtold et al., *supra* note 18, at 12 (policies and programs should include "as much flexibility as possible, keeping in mind the myriad of unique circumstances that farmers face" and will need to "tailor cover-cropping plans to their operations, goals and preferences").

55. *See, e.g.*, Dunn et al., *supra* note 26, at 36 (finding that "producers operating larger farms are thought to be more receptive to using practices capable of reducing costs or increasing yields" and "[t]he presence of a supportive landowner or not renting also emerged as a significant factor").

loss and cover crop adoption exposes significant gaps, or missed opportunities, but also real potential. Historically, the predominant focus of farm conservation policy has been on reducing or controlling erosion which does not exclude or preclude assistance for cover crops.[56] Existing policy does not, however, necessarily prioritize or allow for cover crop adoption, in large part because the priority for the limited funding is typically highly erodible or environmentally-sensitive lands.

The Conservation Reserve Program (CRP), created by the 1985 Farm Bill, is the clearest example because it removes whole fields from production and places them under conservation cover for ten to fifteen years. The CRP has been extraordinarily effective in reducing soil erosion from fields enrolled in the program.[57] From the perspective of nutrient loss, however, the program's shortcoming is, as traditionally-designed, that it removes acreage from production for many years. It has limited application to the highly-productive, intensely-drained fields that are leaking nutrients in the course of producing necessary quantities of vital food and feed grains. The CRP is also an expensive program consuming scarce federal conservation dollars over a decade or more of fiscal years.[58]

VI. POLICY CRITIQUES

To address this policy shortcoming, Congress created and has consistently expanded what are known as working lands programs.[59] These programs are direct federal assistance to farmers that help with the costs of implementing conservation practices on lands that continuously produce crops.[60] The current suite of working lands programs do not contain a specific program for cover crops or nutrient loss reduction, but the Environmental Quality Incentives Program (EQIP) comes

56. Coppess, *A Return to the Crossroads*, *supra* note 1, at 352; *see* Bowman et al., *supra* note 41 (USDA assistance has historically been "focused on reducing the impacts of soil erosion, which is an intermediate step in the process of soil degradation.").

57. *See, e.g.*, Mark A. Nearing et al., *Natural and Anthropogenic Rates of Soil Erosion*, 5 INT'L SOIL & WATER CONSERVATION RES. 77, 77 (2017); U.S. DEP'T OF AGRIC., ENVIRONMENTAL BENEFITS OF THE CONSERVATION RESERVE PROGRAM 1 (2016), https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/EPAS/natural-resouces-analysis/nra-landing-index/2016-files/environmental_benefits_of_mississippi_river_basin_crp_2016.pdf (reporting 148 million tons of sediment reductions in 2016 from CRP); MEGAN STUBBS, CONG. RESEARCH SERV., R42783, CONSERVATION RESERVE PROGRAM (CRP): STATUS AND ISSUES 14 (2014) (reporting an eight billion ton reduction in soil erosion since 1986).

58. *See generally* Jonathan Coppess, *CBO Baseline and the Potential for Conflicts by Expanding CRP*, CHOICES, 4th Quarter 2017, at 1 [hereinafter Coppess, *CBO Baseline*].

59. Coppess, *A Return to the Crossroads*, *supra* note 1, at 374-75.

60. *Id.*

close.[61] Achieving meaningful reductions in farm field nutrient losses and adoption of cover crop practices, however, suffers from a variety of programmatic limitations. These include limited funding available for and acres permitted in the programs.[62] They also suffer from a variety of operational complexities and an inability to reach the scale and scope necessary through strategic coordination of the assistance. From a farmer's perspective, these programs do little to help manage farm risk, especially the economic risks of low crop prices. From a water quality perspective, the programs do not provide for sustainable conservation across large acreages, numerous farms, or multiple watersheds. The end result is a limited level of conservation spread at random across the landscape with little potential for permanence, especially when farm incomes are squeezed by low prices and high costs.

The missed opportunities in current policies, however, extend beyond limits in EQIP funding, complexities in Conservation Stewardship Program (CSP), and the inapplicability of CRP. Only a quarter of all spending on farmers in the Farm Bill is in conservation programs.[63] Billions, however, are spent on program payments that are commodity-centric and focused on low crop prices.[64] These policies only have incidental natural resource benefits due to the requirement that farmers remain in compliance with conservation requirements on highly-erodible land or

61. The two main programs for federal assistance for soil health, including cover crops, are the Environmental Quality Incentives Program and the Conservation Stewardship Program. U.S. Dep't of Agric., *Environmental Quality Incentives Program*, FIN. ASSISTANCE, https://perma.cc/DE9V-H455 (note that cover crops are listed under "Popular Practices" heading). *See generally* Agricultural Act of 2014, Pub. L. No. 113-79; 16 U.S.C. § 3839aa (2012).

62. *But see* Bowman et al., *supra* note 41. From 2005 to 2013, EQIP payments for cover crops increased from $5 million to $50 million, and from 2009 to 2014 "the number of acres receiving EQIP payments for cover cropping" increased from 312,552 to 825,808. Additionally, acres receiving CSP payments for at least one soil health practice grew from under 7 million to over 30 million between 2010 and 2014. USDA reports indicate that EQIP has had over 30,000 contracts for cover crop financial assistance in recent years, with more than 900,000 acres under contract for the practice. From 2005 to 2016, NRCS indicates that less than 5% of acres receiving conservation assistance related to water quality were for cover crops. Just over 10% of the acres receiving conservation for soil quality went to cover cropping practices; over 18 million acres receiving conservation in 2015 and over 15.7 million acres in 2016; for soil quality, 999,500 acres went into cover crops and 964,000 in those years (respectively). *See Environmental Quality Incentives Program*, *supra* note 61.

63. *See* CONG. BUDGET OFFICE, CBO'S JUNE 2017 BASELINE FOR FARM PROGRAMS (2017), https://www.cbo.gov/sites/default/files/occurring/data/51317-2017-06-usda.pdf; Jonathan Coppess et al., *Reviewing the State of the Farm Bill: Perspective from Spending*, FARMDOC DAILY (Feb. 1, 2018), https://perma.cc/QMT7-65G6.

64. 5% of the projected 2014 Farm Bill cost would be spent on commodities. U.S. Dep't of Agric., *Projected Spending Under the 2014 Farm Bill*, FARM & COMMODITY POL'Y (Jan. 16, 2018), https://perma.cc/PAX2-2GKW.

wetlands to be eligible.[65] Billions more are spent helping farmers afford crop insurance policies to manage production and price risks within a growing year, but the conservation benefits of this policy are also limited to compliance requirements.[66]

A potentially more fundamental issue is how this compartmentalized policy framework fails both farmers and natural resource conservation goals by setting conservation apart from farm income support and risk management. The current policy regime built into the Farm Bill effectively treats conservation as something separate from farming rather than an integral, integrated component of farm production and management. Taking this point a step further, the current system fails to sufficiently account for the issues inherent in the type of in-field conservation that cover crops represent, from risk to yield and profitability, to soil health and water quality. Assistance is separate and different; it is often relegated to something that is nice to have when farmers have the time and patience to go through another agency system. Assistance is not integrated with farm risk policy and farm income support policy, therefore it is categorically segregated from large components of farming. Thus, the entire suite of policies miss opportunities presented by matters such as soil health and cover crops.

VII. POLICY SOLUTIONS

Improving upon this policy status quo would begin with efforts to better work within the commercial crop framework, allowing flexibility so that farmers could learn, experiment, innovate, and adapt year-to-year. To date, however, the policies do not match the scale and scope of the challenges nor farming. In that way, cover crops expose the existing policy infrastructure's failure to treat conservation as a vital and necessary component of crop production. Fully integrated farm policy would seek to appropriately cover the short-term costs of cover cropping, as well as helping farmers to manage the risk of practice adoption for yields and income or profitability. Rather than retiring acres or locking in multiple years of contracted practices, such a policy would seek to achieve natural resource risk management in the short term with flexibility to manage through uncertainty. It would be built with an understanding of the potential for longer-term benefits to yield stability and resiliency. It would provide not just cost-share but risk management for farms' income and profitability, while encouraging innovation and the search for managing costs or economic efficiencies. For example, pegging assis-

65. For example, "sodbuster" and "swampbuster" are two programs that take away commodity program eligibility if a farmer converts highly erodible land or wetlands. *See, e.g.*, Food Security Act of 1985, Pub. L. 99-198, § 2611.

66. *See Projected Spending Under the 2014 Farm Bill*, *supra* note 64.

tance to crop prices as a method for helping farmers manage the financial transition, but phasing-out over time if prices are high enough to permit farmers to cover the costs. This would ease farmers' transactional costs with both the United States Department of Agriculture and landlords.

The federal policy canon lacks a simple, coherent program to help farmers manage price, production risk, and natural resource risks. Society's investment in agriculture is limited and piecemeal with little for the average citizen in return, of which the Des Moines Water Works lawsuit provided a jarring reminder. The suit should also serve as a catalyst for pulling together the disparate threads of federal programs and incorporating the lessons of science and history to redesign policy to meet this glaring need. Instead of stale debates over which programs to increase or decrease, or which commodities are afforded more generous payments, the upcoming effort to reauthorize the Farm Bill could begin to seize this opportunity, revise federal farm policy to help farmers reduce nutrient loss and citizens to invest in water quality. The history, however, teaches that revolutionary changes to farm policy are rare, especially during eras of relatively low crop prices. When major changes do occur, moreover, they are often burdened with unintended consequences.[67] Thus history, coupled with the scope of the nutrient loss challenge, counsels incremental over radical changes. Such incremental change could come in three important revisions to existing policies.

First, Congress could repurpose commodity support programs so that the price-risk component incorporates conservation practice assistance. For example, the Marketing Assistance Loans available to producers of a select category of bulk commodities could be revised to provide an option to farmers for a loan to help with cover crops and soil health practices.[68] Farmers could take out a loan in return for an agreement to undertake such practices, and if prices fell sufficiently during the loan period, a portion of that loan could be forgiven and thereby help offset some farm risk. Such a policy revision could go a long way toward helping improve the permanence of conservation practice adoption, especially for a practice such as cover crops. A farmer would receive the loan as a form of operating cash that roughly coincides with establishing the cover crop but would generally be expected to repay the loan in full (plus interest) at the time that the commercial crop is planted. This would help manage the additional cost of the practice which, in turn, would help incorporate it into a farm's financial management. It could, for example, help avoid the need to sell the harvested crop at low prices in order to

67. *See* COPPESS, THE FAULT LINES OF FARM POLICY, *supra* note 1.

68. *See* Coppess, *A Return to the Crossroads*, *supra* note 1, at 386-87. In the interest of full disclosure, please note that I have worked on this policy concept for the Illinois Farm Bureau Federation in conjunction with that organization's efforts to have the policy included in the upcoming Farm Bill.

pay for establishing the cover crop. It also provides some assurance to farmers that if prices fall too far, the decision to adopt the practice will effectively be covered by federal assistance.

Second, Congress could make minor revisions to the crop insurance program that would seek to incentivize cover crop adoption.[69] Crop insurance covers only those losses to a crop that are due to natural causes beyond a farmer's control, and to remain covered, a farmer must have used good farming practices. Current policy could be revised to ensure that a farmer who innovates in the field for purposes of soil health and nutrient loss is not punished if the weather doesn't cooperate. An additional revision could ensure that if a cover crop contributes to a farmer's inability to plant a commercial crop as planned, insurance policies will continue to cover the loss, which is known as prevented planting. These improvements require minor legislative changes, but could be significant on the ground, freeing a farmer to innovate and ensuring the benefit of the doubt in their insurance coverage.

Finally, if the CRP program is going to continue to consume a large portion of federal conservation dollars, or if the program is to be expanded and consume additional dollars that could go toward working lands policies, it could be modified to better incorporate working lands concepts and, especially, cover crop practices.[70] At its core, the CRP provides rental payments in return for conservation cover. It could easily be modified to do so on a temporary basis for cover cropping during the fallow months of the year. Instead of renting land out of production for ten to fifteen years, a subset of acreage could provide annual rental payments for an agreement to establish cover crops on the acres between commercial crops. This would provide a farmer with direct assistance for the adoption of the practice and could be scaled to help advance adoption without fully subsidizing the costs for adoption on all acres. It would offer assistance for initial, limited adoption with an investment in farmer innovation, but not force the innovative farmer to bear the entire costs of helping reduce nutrient loss and improve water quality.

69. *See* Jonathan Coppess & Gary Schnitkey, *Farm Bill Issue Review: Crop Insurance and Cover Crops*, FARMDOC DAILY (Sept. 21, 2017), https://perma.cc/Z876-AJM8. In the interest of full disclosure, please note that I have worked with the Illinois Corn Growers Association on this policy concept in conjunction with that organization's efforts to have the policy included in the upcoming Farm Bill.

70. *See generally* Coppess, *CBO Baseline*, *supra* note 58. In the interest of full disclosure, please note that I have also worked with the Illinois Corn Growers Association on this policy concept in conjunction with that organization's efforts to have the policy included in the upcoming Farm Bill.

VIII. CONCLUSION

In the wake of the Des Moines Water Works lawsuit—both in its consummation and its abrupt conclusion—there are important lessons for efforts to reduce farming's nutrient loss and its concomitant water quality degradation. Neither regulation nor litigation are likely to make significant progress; both could be counterproductive from a farmer's perspective. This is a problem best-suited for policy responses, and the upcoming Farm Bill offers the most important opportunity for effective policies. Success will require a sustained political effort to overcome entrenched interests and resistance. Farmers and farm interests should see the long-term benefit of combining environmental outcomes with the federal assistance they have long deemed important. Similarly, environmentalists and conservation interests should see long-term benefits from dismantling existing programmatic barriers to conservation adoption, as well as, incorporating risk-based policy elements. Achieving meaningful outcomes does not require radical changes in policy or programs, and minor efforts of a perfecting nature might be preferable. More importantly, failure to make meaningful progress may risk more radical efforts in the future. Policy and political history teach that widespread, long-term societal problems rarely disappear and the longer they fester the more likely the political response will be an outsized reaction.