Using Indirect Regulation to Reduce Environmental Damage From Farming

by Edwin Kisiel

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Scientists have found that the planet is hurtling toward a mass extinction of insects.[1] Insects are necessary from an agricultural standpoint because they are the pollinators that farmers need in order to grow crops.[2] However, pesticide and fertilizer (agrochemical) use is a significant factor in the steep decline of insect populations.[3] Farmers are famously resistant to regulation, and agrochemical use is a largely unregulated area.[4] However, farms contribute a significant amount of air and water pollution, especially through agrochemical use.[5] Programs such as "Swampbuster" and "Sodbuster" have been very effective at curbing the decline of highly erodible land and wetlands.[6] These programs use indirect regulation to accomplish their purpose by conditioning receipt of subsidies on not developing highly erodible soil or wetlands.[7]

The success of the Swampbuster and Sodbuster programs shows that the most effective way to regulate farms to reduce agrochemical use and support pollinator populations would also be through indirect regulation. This Comment proposes conditioning farmers' receipt of subsidies on their compliance with new regulations on agrochemical uses as well as mitigation measures. While this may be difficult to accomplish in the current political climate, this proposal would be more politically feasible than direct, command-and-control regulation, and more palatable than the alternative of future regulation under the Endangered Species Act (ESA).[8]

The Comment will first discuss the problems presented by excess usage of agrochemicals for the pollinator population. It will then show how indirect regulation of farms through the 1980s Sodbuster and Swampbuster programs has worked to conserve soils and wetlands, and lay out how the success of these programs could be replicated as a targeted approach to indirectly regulate agrochemical use, support pollinator populations, and reduce agricultural pollution. Lastly, it will look at the political feasibility of the proposal as contrasted to alternatives such as command-and-control regulation or continuing the status quo as pollinator population declines further.

I. Background

By the end of the 20th century, agrochemical use had become synonymous with farming. Agrochemicals include chemical pesticides and fertilizers, such as nitrogen, phosphorus, and potassium.[9] While per-acre applications of phosphorus and potassium have remained "stable since 1960," nitrogen fertilizer application per acre has climbed nearly fivefold over the same time.[10] Pesticide use stems back to the 1870s, but the widespread use of chemical pesticides began after World War II and accelerated rapidly through the 20th century, especially for major crops such as corn and soybeans.[11]

Author's Note: The views expressed in this Comment are solely those of the author and do not reflect the official policy or position of the U.S. Air Force, U.S. Department of Defense, or U.S. government.

1. Douglas Main, *Why Insect Populations Are Plummeting—And Why It Matters*, Nat'l Geographic, Feb. 14, 2019, https://www.nationalgeographic.com/animals/2019/02/why-insect-populations-are-plummeting-and-why-it-matters/.
2. *Id.*
3. Francisco Sánchez-Bayo & Kris A.G. Wyckhuys, *Worldwide Decline of the Entomofauna: A Review of Its Drivers*, 232 Biological Conservation 8, 20-21 (2019), *available at* https://www.sciencedirect.com/science/article/pii/S0006320718313636.
4. J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 Ecology L.Q. 263, 266 (2000) (discussing that the environmental harms caused by farming "have escaped serious regulatory attention even through the recent decades of environmental awakening").
5. *Id.* at 282-86.
6. *See* National Wildlife Federation, Wetland Conservation in the Farm Bill 2 (2018), *available at* https://www.nwf.org/-/media/Documents/PDFs/Our-Lands/NWF-Wetland-Conservation-Farm-Bill.
7. *Id.*
8. 16 U.S.C. §§1531-1544, ELR Stat. ESA §§2-18.
9. *A Look at Fertilizer and Pesticide Use in the United States*, GRO Intelligence (June 11, 2018), https://gro-intelligence.com/insights/a-look-at-fertilizer-and-pesticide-use-in-the-us.
10. *Id.*
11. Craig D. Osteen & Philip I. Szmedra, Agricultural Pesticide Use Trends and Policy Issues 5, 30 (1989) (discussing, for instance, that the rate of herbicide application stood at 10% of selected cropland in the 1950s, increasing to more than 90% by 1980).

A. The Problem With Agrochemical Use

Scientific study has shown that pollinator populations in the United States are widely exposed to multiple pesticides.[12] Consequently, the populations of bees and other pollinators are steeply declining. Pollinators come in many forms, such as bees, butterflies, moths, flies, hummingbirds, bats, and other creatures.[13] Since the widespread use of chemical pesticides following World War II, honeybee populations in the United States declined from an estimated six million to 3.5 million.[14] Long-term trends indicate that over the past 25-30 years, one-half of wild bee species studied across the United States declined by as much as 96%, and butterfly populations in California have diminished by 23%.[15] Some of the "sharpest population declines were recorded in regions dominated by intensive agriculture."[16]

Pollinators can become exposed to pesticides both during pollen collection from treated plants and from contact with airborne chemicals during or after airborne pesticide applications.[17] Insecticides are the most toxic of pesticides to pollinators such as bees, butterflies, and moths.[18] Rodenticides are toxic to larger pollinators such as birds and bats.[19] Herbicides can impact pollinators by killing the wildflowers that serve as food sources for the pollinators, thus providing insufficient food to support the pollinator population.[20] Though agrochemical use is a leading factor in pollinator population decline, it is not the sole factor.[21]

Monoculture farming, where vast landscapes are used for the cultivation of a single crop, is made possible by wholesale spraying of herbicide-resistant genetically modified crops with herbicides.[22] Monocultures also require heavy use of pesticides because they encourage predation by providing a large food source for pests,[23] and chemical fertilizers to counteract nutrient deficiencies that monocultures create in the soil.[24] In addition to pesticide use, monoculture farming contributes to pollinator decline because monocultures lack biodiversity.[25] Thus, monocultures provide insufficient food sources for pollinators.[26]

B. Discussion of Laws Regulating the Agriculture Industry

The agriculture industry has been able to largely escape regulation under the nation's environmental laws.[27] The Clean Water Act (CWA),[28] as originally written, would have required farms to obtain discharge permits.[29] However, to avoid this result, the U.S. Congress amended the law in 1977 to codify an exemption for agriculture.[30] The CWA does not apply to "agricultural stormwater discharges and return flows from irrigated agriculture."[31] However, concentrated animal feeding operations are required to obtain a wastewater discharge permit when they discharge into CWA jurisdictional waters or onto fields that run off into jurisdictional waters.[32]

The Food Security Act of 1985 included two indirect regulation programs, Swampbuster and Sodbuster, that tied land conservation to farm subsidies.[33] Under these laws, farmers' eligibility for U.S. Department of Agriculture (USDA) subsidies is contingent on those farmers not cultivating highly erodible land or wetlands.[34] These programs have proven successful at achieving land conservation goals. The Sodbuster program is responsible for an estimated 25% of the 74 million-acre reduction in eroding land between 1982 (before enactment of the program) and 2012.[35] The rate of wetlands loss dramatically slowed from 300,000 acres per year in the decade preceding Swampbuster's enactment to just over 50,000 acres per year in the decade after Swampbuster was enacted.[36] In the past 20 years, wetlands acreage has been increasing.[37]

12. Christopher A. Mullin et al., *High Levels of Miticides and Agrochemicals in North American Apiaries: Implications for Honey Bee Health*, 5 PLOS One *15 (2010), *available at* https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0009754&type=printable.
13. U.S. Forest Service, *Pollinators*, https://www.fs.fed.us/wildflowers/pollinators/ (last visited July 9, 2019).
14. Sánchez-Bayo & Wyckhuys, *supra* note 3, at 12-13 (noting toxic pesticide residue "found in the pollen and nectar or applied to hives").
15. *Id.* at 11-12.
16. *Id.*
17. Cristina Botías et al., *Quantifying Exposure of Wild Bumblebees to Mixtures of Agrochemicals in Agricultural and Urban Landscapes*, 222 Envtl. Pollution 73, 74 (2017).
18. Minnesota Department of Natural Resources, Trees, Pollinators, and Responsible Pesticide Use for Minnesota's Woodlands 7 (2006), *available at* https://www.pollinator.org/pollinator.org/assets/generalFiles/MinnBroch.final.pdf.
19. *Id.*
20. *Id.*
21. Sánchez-Bayo & Wyckhuys, *supra* note 3, at 14.
22. Gesine Schütte et al., *Herbicide Resistance and Biodiversity: Agronomic and Environmental Aspects of Genetically Modified Herbicide-Resistant Plants*, 29 Envtl. Sci. Eur. 5, 7-8 (2017), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5250645/pdf/12302_2016_Article_100.pdf.
23. Kat Kerlin, *Diversity as Natural Pesticide: Why Insect Pests Love Monocultures, and How Plant Diversity Could Change That*, U.C. Davis, Oct. 12, 2016, https://www.ucdavis.edu/news/diversity-natural-pesticide/.
24. Julia Anderson et al., *Monocultures in America: A System That Needs More Diversity*, Debating Sci. (Dec. 5, 2017), https://blogs.umass.edu/natsci397a-eross/monocultures-in-america-a-system-that-needs-more-diversity/.
25. Sánchez-Bayo & Wyckhuys, *supra* note 3, at 14.
26. *Id.*
27. Ruhl, *supra* note 4, at 266.
28. 33 U.S.C. §§1251-1387, ELR Stat. FWPCA §§101-607.
29. *See* Natural Res. Def. Council v. Costle, 568 F.2d 1369, 1380-82, 8 ELR 20028 (D.C. Cir. 1977).
30. 33 U.S.C. §1362(14).
31. *Id.*
32. *Id.* §502(14). *See* Randolph L. Hill & Sylvia Horowitz, *Wet Weather Regulations: Control of Stormwater and Discharges From Concentrated Animal Feeding Operations and Other Facilities*, *in* The Clean Water Act Handbook 205, 221-22 (Mark A. Ryan ed., American Bar Association 4th ed. 2018).
33. Food Security Act of 1985, Pub. L. No. 99-198, tit. XII, Subtitle A, §§1201 et seq., 99 Stat. 1504 (codified at 16 U.S.C. §§3801 et seq.).
34. *See* 16 U.S.C. §§3801 et seq.
35. Megan Stubbs, Conservation Compliance and U.S. Farm Policy 11-12 (2016).
36. U.S. EPA, Report on the Environment: Wetlands 2, *available at* https://cfpub.epa.gov/roe/indicator_pdf.cfm?i=37.
37. Michael T. Sucik & Elizabeth Marks, USDA, The Status and Recent Trends of Wetlands in the United States 5, *available at* https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1262239.pdf.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is the principal law governing pesticides.[38] It applies to manufacturers and sellers of pesticides,[39] and requires pesticides to be registered before they can be sold in the United States.[40] The U.S. Environmental Protection Agency (EPA) also promulgated regulations under FIFRA.[41] The regulations require product labeling to let users know how to apply the agrochemical and the hazards presented by the agrochemical.[42]

However, FIFRA and accompanying regulations do not regulate the amount of product actually applied or the environmental impact of the product.[43] In developing the label, regulators only consider the amount of the pesticide that would be lethal for pollinators; they do not consider sublethal effects, such as impact on "nesting behavior," learning, or diminished reproduction.[44] While FIFRA directs USDA to educate farmers on pesticide use, there are no requirements placed on farmers to actually follow the preferred practices.[45]

C. *Pollinator-Friendly Practices*

There is a myriad of good practices that farmers can implement for responsible pesticide use to promote pollinator populations and avoid pollution. Biodynamic farming practices offer promise for how to achieve the same goals of pest mitigation while reducing impacts to pollinators and the environment.[46] Examples of effective biodynamic farming practices include integrating pollinator-attracting plants (rose bushes) at the end of each row of grapes and using ducks as a natural form of pest control.[47] Academic research has shown that planting clusters of certain types of flowers through an orchard not only encourages increased pollinator population, but also encourages populations of natural enemies of pests, providing a natural form of pest control.[48] Emerging technology also offers promise for pest control without negatively impacting pollinators. For example, use of remote sensing technology would enable farmers to examine the status of each plant to be able to provide minimal targeted applications of pesticide where it is most needed instead of wholesale aerial or entire field application.[49]

The U.S. Fish and Wildlife Service (FWS) recommends, but does not mandate, that farmers use integrated pest management for pest control.[50] Integrated pest management involves taking a holistic approach to pest management instead of relying primarily on pesticide applications.[51] It requires farmers to consider the level of threat posed by pests and control methods to reduce environmental pollution and promote pollinator populations.[52] Mechanical pest control involves actions such as "tilling, aerating, cutting, [and] digging."[53] This can also involve using traps for rodents instead of rodenticide.[54] Cultural pest control involves planting "trap crops" or "pest-resistant crops," "crop rotation" and cover cropping, using pest-free and weed-free mulch, and creating "beneficial insect habitat." Biological pest control involves using "predatory insects" or other animals for pest control.[55]

Of course, not every environmentally friendly practice will work for every farm. The use of ducks, for instance, may work well with a sturdy plant like a grapevine or in forestry, but may not work for cultivation of salad greens or fragile vines.[56] On the other hand, crop rotation would not work for grapevines or orchards because the grapevines or trees require years to become established.[57]

Responsible golf course management can also provide examples of best practices for agriculture. Golf course management is a similar industry to agriculture, as both involve cultivation of plants.[58] Some practices implemented by an award-winning Virginia country club include not applying pesticides when there is a risk of runoff, maintaining six beehives on the 162-acre property, and using enthusiastic border collies and laser systems to minimize impacts from geese.[59] Between integrated pest management, traditional farming practices, and emerging technologies, farmers have a myriad of alternatives to heavy pesticide use.

38. 7 U.S.C. §§136-136y, ELR Stat. FIFRA §§2-35.
39. *See id*. §136a (requiring registration of pesticides).
40. *Id*.
41. *Id*. §136w; 40 C.F.R. §§156.3 et seq. (2019).
42. 40 C.F.R. §156.10 (2019).
43. *See* Ruhl, *supra* note 4, at 309.
44. Minnesota Department of Natural Resources, *supra* note 18, at 7.
45. 7 U.S.C. §136r-1 (discussing integrated pest management).
46. Biodynamic Association, Biodynamic Principles and Practices (2018), *available at* https://www.biodynamics.com/system/files/pdf/Fact%20Sheet%20-%20Biodynamic%20Principles%20and%20Practices%20-%202018%20FINAL.pdf.
47. These practices were witnessed by the author during a tour of La Maison Penet's vineyards in the Champagne A.O.C. region of France in July 2017. For a recent documentary that follows a biodynamic farm in California that uses integrated pest management, such as ducks to control pests, see John Chester, The Biggest Little Farm (2019).
48. Alistair John Campbell et al., *Getting More Power From Your Flowers: Multi-Functional Flower Strips Enhance Pollinators and Pest Control Agents in Apple Orchards*, 8 Insects 101, 114 (2017), *available at* https://www.mdpi.com/2075-4450/8/3/101/htm.
49. *See*, *e.g.*, Emil Venere, *Remote Sensing, Better Use of Data Promise to Improve Agriculture*, Engineering Frontiers, Fall 2018, *available at* https://engineering.purdue.edu/Frontiers/fall-2018/remote-sensing-and-better-use-of-data-promise-to-improve-agriculture.
50. FWS, Reducing Risks to Pollinators From Insect and Plant Pest Control 1 (2018), *available at* https://www.fws.gov/pollinators/pdfs/FWS_IPM_Farmland_Outreach_Final_April_26_2018_web_508.pdf.
51. *Id*. at 1-2.
52. *Id*.
53. *Id*.
54. Interview with Andy Niner, President, Niner Wine Estates, in Alexandria, Virginia (Apr. 2, 2019).
55. FWS, *supra* note 50, at 2.
56. *See*, *e.g.*, Penny Lewis, *Ducks as Effective (and Entertaining) Pest Control*, Ecological Landscape Alliance (Aug. 11, 2012), https://www.ecolandscaping.org/08/pest-management/ducks-as-effective-and-entertaining-pest-control/.
57. Interview with Andy Niner, *supra* note 54.
58. Golf course management provides a close parallel to agriculture. Where agriculture involves growing and harvesting crops, golf course management involves growing and cultivating grass. Both agriculture and golf course management are concerned about the encroachment of weeds on the cultivated plants.
59. Golf Course Superintendents Association of America, *Mike Augustin Wins VCGSA Environmental Stewardship Award*, *reprinted in* 67 Haven: Belle Haven Country Club 10 (2019). However, from the author's experience, the geese still take over the golf course in winter!

II. Discussion

Solving the problem of pollinator population decline will require controlling the main causes that threaten pollinators. Research points to agrochemical use of fertilizers and pesticides as the leading cause. By reducing the amount of chemicals applied in the process of growing crops, farmers can reduce the threat that intensive agriculture poses to pollinator populations. However, to enact such a change will likely require government intervention. As farmers have been resistant to command-and-control style environmental regulation, the concept of indirect regulation followed by the Swampbuster and Sodbuster programs provides the most palatable framework for regulation of agrochemical use.

A. *Swampbuster and Sodbuster Provide Examples of Successful Indirect Regulation*

The Swampbuster and Sodbuster programs of the 1980s have successfully conserved significant acreage of wetlands and highly erodible soils.[60] The programs operate on the basis that a farmer's eligibility to receive federal subsidies is contingent on compliance with the program provisions.[61] Affected subsidies include price support payments, certain USDA loan programs, disaster payments, conservation payments, or crop insurance.[62] The 2017 USDA Agricultural Census showed that 31% of farmers received subsidies, down from 39% in 2012.[63] Thus, most farmers would not be affected by this proposal. However, the most impacted farms would be the largest farms since they receive the lion's share of farm subsidies.[64] The average per-acre subsidy for the top 10% of farms by size is just under $30 per acre, while the average subsidy across all farms is around $12 per acre.[65]

Subsidies such as crop insurance are available for more than 130 crops or livestock commodities.[66] Commodity support is available for 25 categories of crops.[67] Almost every type of farm is also eligible for disaster assistance.[68] However, crop insurance payments flow largely to producers of corn, soybeans, and wheat.[69] These are also the crops that are most likely to be planted in monoculture.[70] Corn and soybeans also account for more than one-half of all pesticides used.[71] Even though indirect regulation programs affect less than 40% of American farms, they still have a large overall impact.[72]

Authority for programs such as Swampbuster, Sodbuster, and the program proposed in this Comment comes from the U.S. Constitution's Spending Clause rather than the Commerce Clause, making them more resilient to legal challenge. The Spending Clause provides that "[t]he Congress shall have the Power . . . to pay the Debts and provide for the common Defence and general Welfare of the United States."[73] The power to spend is a broad power with few limitations. The U.S. Supreme Court, looking at the differing opinions of the founding fathers, has adopted the position that the only limitations on the power to spend are that the expenditure must be for national, not local, interest and cannot be for a purpose that is prohibited under the Constitution.[74]

An analogous Spending Clause case that would apply to this Comment's proposal of indirect regulation revolves around Congress' conditioning states' receipt of federal highway funding on adopting the minimum drinking age.[75] In *South Dakota v. Dole*, the Supreme Court held that because the condition served a general welfare purpose, Congress' conditioning of states' ability to receive funds on setting 21 as the minimum drinking age was a permissible exercise of the spending power.[76] Under this Comment's proposal, the provision of agricultural subsidies promotes the general welfare by providing a safety net for farmers, and the proposed conditions to promote healthy ecosystems, especially for pollinators, also promotes the general welfare. Thus, from a Spending Clause perspective, the proposed conditional program would be constitutionally permissible.

B. *Indirect Regulation Can Be Used to Control Pesticide Use*

Educating farmers on pesticide use has been an important first step, but further regulation is needed to ensure

60. *See* National Wildlife Federation, *supra* note 6. *But see* Ruhl, *supra* note 4, at 327.
61. *See* Stubbs, *supra* note 35, at 6 (providing a list of affected benefits).
62. 16 U.S.C. §3811; *id*. §3821 (discussing ineligibility for subsidies when found to not be in compliance); *id*. §3812a (discussing requirement to implement conservation plan within either two years or five years for crop insurance payment eligibility when found to not be in compliance with Sodbuster).
63. USDA, 2017 Census of Agriculture: United States Summary and State Data 16 (2019), *available at* https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_US/usv1.pdf.
64. Anton Bekkerman et al., American Enterprise Institute, Where the Money Goes: The Distribution of Crop Insurance and Other Farm Subsidy Payments 4 (2018), *available at* http://www.aei.org/wp-content/uploads/2018/01/Where-the-Money-Goes.pdf.
65. *Id*. at 4-5.
66. Congressional Research Service, Farm Safety Net Programs: Background and Issues 2 (2015), *available at* https://www.everycrsreport.com/files/20150821_R43758_e5a6d45081df2dbccb5c9386e76566dec014d066.pdf.
67. *Id*. at 3.
68. *Id*. at 5.
69. Bekkerman et al., *supra* note 64, at 3.
70. Tamar Haspel, *Monocrops: They're a Problem, but Farmers Aren't the Ones Who Can Solve It*, Wash. Post, May 9, 2014, https://www.washingtonpost.com/lifestyle/food/monocrops-theyre-a-problem-but-farmers-arent-the-ones-who-can-solve-it/2014/05/09/8bfc186e-d6f8-11e3-8a78-8fe50322a72c_story.html.
71. Jorge Fernandez-Cornejo et al., USDA, Pesticide Use in U.S. Agriculture: 21 Selected Crops, 1960-1980, at 2 (2014), *available at* https://www.ers.usda.gov/webdocs/publications/43854/46734_eib124.pdf.
72. *See* Stubbs, *supra* note 35, at 11-12; U.S. EPA, *supra* note 36, at 2; Sucik & Marks, *supra* note 37, at 5.
73. U.S. Const. art. I, §8, cl. 1.
74. United States v. Butler, 297 U.S. 1, 67-68 (1936) (holding that while the spending power is broad, the program the court was analyzing was not a permissible expenditure because it fell under the role of state police power).
75. South Dakota v. Dole, 483 U.S. 203, 208-09 (1987).
76. *Id*. at 209.

implementation of environmentally responsible practices.[77] This Comment proposes that Congress enact a new program in the mold of Sodbuster and Swampbuster.[78] Under this proposal, receipt of subsidies such as USDA loans and commodity program payments would be contingent on compliance with agrochemical use restrictions and pollinator-friendly farming practices. The program would have a "menu" of farming practices that farmers could choose to implement. These farming practices would be pollinator-friendly practices such as diverse planting to promote crop resiliency and provide pollinator food sources, using technology to encourage targeted pesticide applications, and following integrated pest management.

Farmers would receive one credit for each farming practice they chose to implement. In order to receive subsidies, farmers would be required to implement a set minimum number of farming practices and certify compliance. Farmers would also be required to keep records of agrochemical applications, including the specific chemicals applied, the date and time of application, the method of application, the volume of chemical applied, and the amount of land acreage covered. These farming practices and recordkeeping requirements would be in addition to requirements already in effect under the Sodbuster and Swampbuster programs.

Even though many farmers would not be affected by the program, the most heavily subsidized crops, such as corn and soybeans, are also the ones where farmers use the most pesticides.[79] Thus, the farms that this program affects would be the largest users of agrochemicals or other practices, such as monoculture, that are unfriendly to pollinators.[80] As a result, this proposal provides a targeted approach to the problem of reducing pesticide use and implementing pollinator-friendly practices.

C. *Indirect Regulation Would Be the Most Effective Means to Regulate Pesticide Use*

Traditional command-and-control policies could theoretically produce a more effective result than indirect regulation. However, in practice this would be far more difficult to achieve.[81] First, the farm lobby has successfully resisted efforts to impose regulations on farms. Second, enforcement in farm country is extremely difficult due to the large area that farm country covers. Third, the current political environment may make implementing changes of this magnitude difficult at the federal level.

The idea behind this proposal is to try to use a more directed, less intrusive method of regulation before escalating to more intrusive regulation. This represents a compromise position between continuing to let farmers choose how to best handle their crops and providing regulatory controls over agrochemical use. Many farmers are responsible users of agrochemicals, but there are "bad actors" who use excessive amounts of pesticides.[82] This proposal would put the economic risks on farmers whose agrochemical use is contrary to public policy goals of protecting pollinators and promoting healthy ecosystems. This is contrasted to the status quo where the American taxpayers potentially subsidize the economic risks of these bad actors.[83]

However, because of the federal nature of the U.S. system of government, this program of indirect regulation of agrochemical use may be easier to implement and experiment with at the state level to build a model for federal government regulation.[84] Some states offer their own grant and subsidy programs for farmers, such as California's manure and soils programs or Texas' disaster assistance programs.[85] These states could implement the program proposed here as a condition on receipt of these state grants or subsidies. Of course, this would have less of an impact because it would occur on a much smaller scale. However, it could be a more palatable first step to taking action to decrease agrochemical use if Congress is not prepared to address this issue at this time.

D. *Regulation Under the ESA Is the Likely Alternative*

If pollinator populations continue to decline at current rates, it may force FWS to list certain pollinators as endangered or threatened species.[86] Once a pollinator species is listed, farmers (and everyone else) would be prohibited from a "take" of that species.[87] A take includes actions such as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect."[88] Because agrochemical use has been shown to reduce pollinator populations, applications of pesticides or fertilizers would result in harm to protected species under the ESA definition.[89] Listing pollinators as threatened or endangered would generate a host of regulations that would make conventional agricultural practices difficult and require farmers to adapt pollinator-friendly

77. *See* 7 U.S.C. §136r-1; FWS, *supra* note 50.
79. *See* Bekkerman et al., *supra* note 64, at 3; Fernandez-Cornejo et al., *supra* note 71, at 4.
80. Bekkerman et al., *supra* note 64, at 3; Haspel, *supra* note 70.
82. Interview with Andy Niner, *supra* note 54.
83. *Id.*
84. As an example, California has recently implemented animal welfare laws requiring eggs sold in the state to come from cage-free chickens and set minimum cage size requirements for veal calves and pigs. *See* Caleb Pershan, *CA Voters Pass Cage-Free Egg Proposition With Consequences for Veal and Pork*, Eater S.F., Nov. 7, 2018. While this will be in the mold of traditional command-and-control regulation, a state with a progressive outlook on agriculture may also be a good candidate for a place that this Comment's proposal for indirect regulation of agrochemical use may find footing. *See also* Hannah J. Wiseman & Dave Owen, *Federal Laboratories of Democracy*, 52 U.C. Davis L. Rev. 1119, 1156-57 (2018) (discussing the complementary roles of states and federal government in developing solutions for soil conservation), *available at* https://lawreview.law.ucdavis.edu/issues/52/2/Articles/52-2_Wiseman_Owen.pdf.
85. *See, e.g.*, California Department of Food and Agriculture, *Grant Programs at CDFA*, https://www.cdfa.ca.gov/grants/ (last visited July 9, 2019); Texas Department of Agriculture, *Grants & Services*, https://www.texasagriculture.gov/GrantsServices/GrantsandServices.aspx (last visited July 9, 2019).
86. *See* 16 U.S.C. §1533(b); Sánchez-Bayo & Wyckhuys, *supra* note 3, at 16.
87. 16 U.S.C. §1538(a)(1)(B).
88. *Id.* §1532(19).
89. *Compare* Sánchez-Bayo & Wyckhuys, *supra* note 3, at 20-21, *with* 16 U.S.C. §1538(a)(1)(B).

practices in order to avoid a take of listed pollinators. This would likely affect a much larger swath of farmers than the targeted approach proposed in this Comment.

If indirect regulation proves successful to support pollinator populations, it would also obviate the need for more intrusive regulations that would come with listing under the ESA. Thus, the prospect of indirect regulation of agrochemical use would prove more palatable to farmers when presented alongside the alternative of listing under the ESA, which is where we are headed should the levels of agrochemical use continue under conventional farming practices.

III. Conclusion

The use of agrochemicals, such as pesticides and fertilizers, is a leading contributing factor toward the mass extinction of pollinators. From an agricultural standpoint, pollinators are necessary for the propagation of many crops. There is a role for government regulation to play in changing the behaviors of farmers to reverse threats to pollinators and reduce air and water pollution from agrochemical applications. However, farmers and the farm lobby have proven to be resistant to regulatory efforts under other environmental programs.

Indirect regulation, where eligibility for farm subsidy and loan programs is conditioned on compliance with certain requirements, is the best way to change farming practices to reduce pollution and support pollinator populations. This Comment envisions a program whereby farmers can choose from a menu of practices and receive credits for practices implemented. Farmers will also need to keep records of the volume of agrochemicals applied and when application occurred. If a farmer meets a minimum number of credits and recordkeeping requirements, then the farmer would be eligible for farm subsidy and loan programs.

Indirect regulation relies on the spending power instead of the Commerce Clause and is less subject to legal challenge on constitutional grounds. Indirect regulation has proven successful in promoting soil and wetlands conservation through the Sodbuster and Swampbuster programs. Indirect regulation would also be a compromise in favor of farmers because it is less intrusive than command-and-control regulation and provides room for market forces. While a minority of farms receive USDA subsidies, this approach would be targeted toward the largest users of agrochemicals.

Indirect regulation, if successful, would also mitigate the need to later list pollinator species as threatened or endangered. If pollinator species become listed under the ESA, it would trigger invasive regulation of farming practices that would affect many more farmers than this proposal. The position advocated here, using indirect regulation to change practices regarding agrochemical use and support pollinator populations, would be a far less extreme regulatory result and would thus gain political support when compared to the more intrusive alternative.