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DATA FOR *PROGRESS*

REGENERATIVE FARMING AND THE GREEN NEW DEAL

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SOIL HEALTH IS KEY

The Green New Deal is a broad and ambitious agenda that includes a commitment by the federal government to invest in communities, infrastructure, technology, and good jobs to help the United States meet the challenges of climate change and achieve economic and environmental justice.

United States agricultural land could be one of our greatest resources for positive environmental change. The Intergovernmental Panel on Climate Change (IPCC) considers soil carbon sequestration the lowest cost sequestration option with costs ranging from $0 to $100 per ton.[1] Changing the way we farm could, within 25 years, sequester 20 PgC (petagrams of carbon), more than 10 percent of anthropogenic emissions.[2]

However, instead of being a carbon asset, our nation's soil bank is currently a major ecological liability.

SOIL HEALTH IN NUMBERS

10–100x

Rates that soil is eroding faster than it replaces naturally

$44 billion

Annual cost of soil erosion to Americans

75%

Percentage of 2018 Farm Aid hotline calls related to natural disaster crises

Iowa is likely losing topsoil on average at a rate that is *16 times* higher than the natural replacement rate.[3] Erosion rates from conventionally plowed agricultural fields average 1–2 orders of magnitude greater than rates of soil production, erosion under native vegetation, and long-term geological erosion, meaning that soil erosion rates are 10 to 100 times faster than soil builds naturally.[4] More frequent rains from climate change hit snow and melt it, freeing up water that seeks lower ground in the form of floods. Because monoculture systems deplete soil organic matter and cause the soil to lose its ability to stay in place,[5] the floods carry with it topsoil from the highly erodible monocrop operations and disperse this prime topsoil, as well as the applied pesticides and fertilizers into streams and rivers.[6] Pesticides also kill soil microorganisms and other organisms in natural ecosystems.[7] Yet, when we eliminate pesticides and build healthy soil, the hydrologic function of the soil improves. Building organic matter also improves the ability of the soil to take in and hold water[8], which reduces flooding.[9]

The USDA estimates that the total annual cost to society of erosion from agriculture in the US is about $44 billion, with some lands having lost upwards of 50% of their previous productivity.[10] In 2019, Iowa suffered at least $150 million in damage to agricultural buildings and machinery; 100,000 acres of Iowa farmland were submerged.[11] In Ohio this year, 1.5 million of the state's 9.9 million acres went unplanted due to record rainfall and flooded fields.[12] A warmer planet promises heavier rain, which will accelerate this phenomenon.[13]

The economics of farming are failing farmers. Farm debt has now reached levels last seen in 1980, which marked the dawn of a devastating farm crisis. Many would argue we are in a farm crisis now, with debt and bankruptcies on the rise.[14] Farm bankruptcies in the Midwest jumped 19 percent in 2018, reaching their highest level in a decade.[15] Last year, Farm Aid's hotline call volume increased 109% over 2017. Historically, crisis-related calls to the hotline have been 20 to 30 percent of calls on average. By the end of 2018, 75 percent were spurred

by natural disasters alone. A majority of weeks, Farm Aid receives calls from farmers who say they are suicidal.[16] This brief explains how policies that improve soil health in the United States can spur fundamental progress in the United States' ability to combat climate change while improving environmental and economic equity for those affected. It focuses on changing the top two impediments to improving soil health:

1) **policies that currently incentivize monoculture farms over diversified farming systems**
2) **lack of training and support for farmers who engage or want to engage in healthy ecological practices**

VOCABULARY FOR PROGRESS: **MONOCULTURE**

Monoculture is the growing of one crop at a time. In the US, many farms are managed as continuous monocultures, or near to it, in which one or two crops are the only crops grown year after year on the same land. This practice includes simple rotations such as corn and soybeans. While logistically easier to manage, it strips soil of biodiversity, negatively impacting soil health. Negative consequences include overreliance on synthetic fertilizers and pesticides, topsoil erosion and decreases in the soil's ability to hold water, leading to floods, catastrophic crop losses, and the overproduction of food ingredients used in nutrient-poor junk foods for the average American citizen.[17]

MONOCULTURE FARMS focus on competing in global markets, industrial technologies, and inputs such as pesticides and fertilizers, and a commodity-based approach to agriculture.[18]

DIVERSIFIED FARMING systems focus on local production, agroecological and local knowledge, and whole systems approaches to agriculture, which reduce the need for chemical inputs.[19]

SUPPORT DIVERSIFIED CROP PRODUCTION BY REFORMING GOVERNMENT INCENTIVES

Problem: Some land is not suitable for crop growth, yet Federal Crop Insurance and marketing assistance loans aggravate our soil crisis by creating incentives to farm highly erodible land and wetlands.

In 2019, more than one-third of US farmers' net farm revenue is projected to come from government subsidies, primarily from the Federal Crop Insurance Corporation.[20] However, federal crop insurance guarantees minimum yields and prices for only certain crops – commodity crops such as corn, soy, wheat, rice, and cotton. Because these crops can be covered by insurance whether they get harvested or not[21], growers often plant these commodity crops on land that is not suitable for their growth.[22] While only 2% of US farmland is dedicated to the production of fruits and vegetables[23], 59% is used to grow commodity crops, particularly corn and soy for livestock feed in highly destructive CAFOs (Concentrated Animal Feeding Operations). The result is the subsidization of farming practices that are destructive to human health and our environment.[24]

1/3+

of US farmers' revenue comes from government subsidies, yet almost none of those subsidies promote healthy soil practices and ecological restoration.

> Our current system has done a bang up job teaching me how to emit carbon and deplete finite resources to raise food. I don't think it's unreasonable to ask for research funding and policy that helps me raise food, put carbon back into our soil, and restore the natural resources that we all depend upon.

Seth Watkins
Iowa Farmer

Marketing assistance loans were designed to be a means of providing price supports. In theory, a farmer would take out a "non-recourse" loan on the value of the crop's projected yield, and if the market price fell below the support price, the farmer would pocket the loan while USDA would take the crop. The issue is that agribusiness uses political power to set the price floor well above average costs of production, so that in the absence of a government supply management program, farmers are incentivized to overproduce, because they know the government will "buy" the crops at profitable prices. The resulting chronic surpluses have left the U.S. government scrambling to develop programs to create new markets, developing an ethanol program and promoting export markets, as well as encouraging food manufacturers to turn surplus commodities to junk foods that threaten public health. Other forms of commodity prices supports have had similar consequences.

Solution: Reduce and eventually eliminate current government incentives for monocultural farming systems. Transition government farm program funding from current crop/price insurance programs, which are absorbing the production and market risks of large industrial, monocropping farming operations, towards supporting the transition of current commodity producers and beginning family farmers to diversified regenerative and agroecological farming operations. **Systematically replace commodity-based programs with a comprehensive, subsidized "whole farm net revenue" insurance program, explained below.**

POLICY RECOMMENDATIONS:

- **Reform current monocultural crop insurance programs in the following ways:**
  - Limit eligibility for government subsidized crop insurance to crops grown using approved soil conservation practices, including stream buffer strips, cover crops, and other practices to reduce pollution and sequester soil carbon.[25]
  - Place limits of total acreage and insurance coverage of all insured crops eligible for government subsidized crop insurance at $250,000 gross farm income per insured farm - the level currently defined by the USDA as the minimum gross farm income for a "large farm."
  - Over time, phase out government subsidized crop insurance programs for single crops and all other commodity-based programs, such as marketing assistance loans, unless accompanied by supply management programs that eliminate incentives for production in excess of needs for domestic food security.
  - Replace the current crop insurance program with a Whole-Farm Net Revenue Insurance program in the form of a tax credit program that shares the risks of transitioning from industrial agriculture to regenerative, sustainable farming systems.

- The USDA currently has a Whole-Farm Revenue Protection program[26], but it only insures a percentage of average historic gross farm revenue. Instead of insuring based on historic whole-farm revenue, the new program would insure based on net farm revenue needed to guarantee a certain level of farm family income relative to the medium non-farm family income, based on incomes in the geographic area of the farm.

WHAT IS NET REVENUE?

Net Revenue, otherwise known as net income, is total farm sales - farm operating costs.

- To qualify for government sustainability transition payments, farmers would be required to submit a whole-farm plan, which includes farming practices similar to those required for the current Conservation Stewardship Program (CSP). To provide domestic food security, the transition program would logically focus on incentivizing full-time family farming, which might be called the "Family Farm Transition Program" (FFTP)
- Government transition incentives could be in the form of guaranteed "tax credits," similar to those in current "Earned Income Tax Credits" for low income taxpayers. If a farm family's income falls below the insured level, farmers would get a tax credit from the government to make up the shortfall.

REWARD FARMERS FOR PROTECTING ECOLOGICAL FUNCTIONS AND INVEST DIRECTLY IN ECOLOGICAL RESTORATION PROGRAMS

WHAT ARE ECOLOGICAL SERVICES?

Ecological services are practices that protect and restore ecological functions, including building soil health, conserving water, sequestering carbon, and protecting soil microorganism, pollinators, and other wildlife, including natural enemies of agricultural pests.

These practices make farming systems are more resilient to climate change impacts, help mitigate climate change, and support vibrant rural economies. This will require significant investment in technical training on a national scale.

The specific practices include:

- Perennialization
- Crop rotations
- Low and no till
- Compost
- Intercropping
- Agroforestry
- Integration of animal and crop production
- Habitat protection for pollinators
- On-farm nutrient management[27]

Problem: While the benefits of healthy soil range from carbon sequestration and water conservation to micro-nutrient rich crops and more nutritious food, under existing commodity-based programs, US farmers are only compensated for what they're able to sell. As a result, the potential of our agricultural land - our greatest resource for improving the health of our environments and population - is squandered, while the long term effects of poor soil management continues to destroy our environment and poison our bodies.

Maintaining agricultural practices that promote sustainable farming systems by eliminating soil erosion, reducing fertilizer and pesticide use, building healthy soils, and increasing biodiversity, is work. Markets for agricultural commodities do not provide adequate incentives for farmers to implement such practices despite the fact that these practices clearly serve the public interest. This represents a "market failure" that requires government involvement to serve legitimate public interest.

Technical training falls short on ecological practices. The USDA Natural Resources Conservation Service (NRCS) maintains a network of soil health specialists across the US and works in partnership with local Conservation Districts to provide on-farm conservation planning and technical assistance to producers. The Cooperative Extension System (CES) also provides technical assistance to farmers, but CES funding has declined and has caused the number of extension full-time-equivalent (FTEs) to decline significantly over time and across regions.[28] NRCS and CES specialists could be retrained and repurposed to work collaboratively in helping farmers develop regenerative farming systems rather than focusing on the transfer of specific best management farming practices and technologies. This would refocus their efforts on serving the public interest and justify increased public funding.

Solution: Incentivize and support existing programs to prepare current producers for a transition from monoculture farming to soil building, carbon sequestering, regenerative farming systems.

POLICY RECOMMENDATIONS:

- **Reward farmers for undertaking practices that enhance ecological functions** (see box) through government programs such as the Conservation Stewardship Program (CSP).[29] Pay farmers to retire croplands to native prairie in historic prairie areas. Through advanced geospatial technology , we can look at places where we shouldn't be farming, and these could be places to retire to prairie. Prairie patches (even when implemented on a small percentage of cropland) have been shown to trap significantly more carbon underground than crop farming.[30] Incentivize pasture intercropping/rotational pasture crop systems in areas of lower yields croplands to reinvigorate them and add income streams.

- **Transform training for existing US soil health experts.** The USDA Natural Resources Conservation Service (NRCS) should maintain an existing network of soil health specialists across the US and work in partnership with local Conservation Districts to provide on farm conservation planning and technical assistance to producers. Many of these specialists may need to be retrained to assist with soil revitalization and regeneration, in addition to current expertise in soil and water conservation. Current emphasis on conservation practices, such as reduced tillage, cover crops, and stream buffer strips, needs to be integrated into regenerative whole farm plans.

- **Increase funding to the USDA Conservation Programs**. The Conservation Reserve Program (CRP), the Environmental Quality Incentives Program (EQIP), and the Conservation Stewardship Program (CSP) will require increased on-ground staff and technical assistance capacity to successfully service their regions, where the staff are trained in the principles of agroecology and regenerative agriculture.

- **Establish a joint incentive and education program through the USDA Agricultural Research Center (ARS)** and NRCS for the agricultural production and use of compost, biochar, mulch and other organic amendments that improve soil health. The program should invest in research and development for organic amendments and markets and provide financial incentives that assist farmers in production and procurement. TX and CA have model policy programs that work to simultaneously improve local water quality and develop compost markets[31] [32]. The program should be funded from the 45Q tax provision.[33]

- **Grow the R&D budget for carbon sequestration practices.** This can be done by increasing the capacity of the NRCS and local Conservation Districts to develop whole carbon farm plans with landowners using the COMET planning tool, a metrics-based program developed by USDA NRCS that helps farmers estimate the GHG impacts of their farms[34].

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