A Progressive View of The Farm Bill

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Parts of this talk

I. Agriculture is harming the climate and the soil
II. Solutions that the Farm Bill can help to scale up
III. What's impeding such changes to the Farm Bill?
IV. Yet we persist: Problems, and Opportunities, "Marker Bills"

Part I: Agriculture's impact on the climate

- EPA -- agriculture produces 10% of greenhouse gases
- Other thoughtful estimates: 15% to 30% or more –
  - Methane and nitrous oxide are powerful greenhouse gases
  - Manufacture of fertilizer is energy intensive
- Drawdown, by Paul Hawken, ranks regenerative agriculture as the 11th of 80 most impactful solutions for reducing greenhouse gases .

Worries about food and soil

- Food shortages - 9% of world face hunger; 30% are food insecure
  - Nations' restrictions on trade in food
  - Increasing vulnerability to disease

- Soil erosion and damage
  - Kiss the Ground video --- 60 years of harvests left
  - "Corn belt farmland has lost a third of its carbon-rich soil";
- *Positive feedback* to climate change (like in Arctic tundra); All organic matter decomposes faster as the soil warms

Modern awareness of old soil truth

- In healthy soil, green plants and soil microbes cooperate
- Plants synthesis CO2 from air into an abundance of sugars
- Plants release (extrude) up to 40% of their surplus nutrients into through their roots, where it nourishes the soil's microorganisms .(bacteria, fungi, and others)
- which then can store the nutrients and provide them back to green plants at optimal times

What has damaged soils of the USA?

- For millennia, *tilling the soil* exposed microbes to the air – killing them. Some microbes survived below the surface.
- But industrial-scale farming overcame the resilience of the microbe community, so Soil Organic Carbon began a bad decline.
- 1930's Dust bowl
  - Bare soil and no windbreaks
  - Wind erosion and dust storms

Nitrogen fertilizer

- Plentiful after ammo plants shut down after 1945
- Supports amino acids . . . bumper crops
- Downside: plentiful nitrogen in soil make some microbes hungry; they attack stable organic matter --- the bacteria, fungi etc. that had lived in cooperation with green plants.
  - Lauren Quinn, “Study clarifies nitrogen’s impact on soil carbon sequestration”, (U of Illinois, Dec 15, 2021)

In soil with inadequate organic matter, green plants produce food that's less nutritious

- Dr. Mark Hyman, who has appeared on PBS:
  - Beneficial [soil] bacteria . . . cross-talk with our own microbiome. [i.e., with the microbiome within each person's digestive system]" i.e. that helps our health;

[I.e. ., the microbes of rich soil produce complex substances that reside in the fruits and produce taken from the field, which a diverse set of microbes in our guts can beneficially use]

- But "a lack of organic matter in the soil . . . prevents plants from being able to access nutrients, so they provide us with less of them"

Lower-carbon soil --less capable of holding water

- In healthy soil, fungi would secrete *glomalin*, which causes soil particles to clump, creating voids that hold air and water;
  - rain soaks in; does not quickly run off
- But after fertilizers reduce soil carbon, soil becomes *compacted* and holds less water;
- [A 1% increase in soil organic matter enables retention of 20,000 more gallons of water per acre]
- Excessive runoff carries some fertilizer into streams;
- Algae bloom below river deltas, and then rot, consuming oxygen, causing dead zones with no marine life

Water in the soil affects rainfall patterns

- So long as Earth's temperature is moderate, some water in soil evaporates, bolstering moderate local rainfall--- The Small Water Cycle explained
- (A full explanation of the Large Water Cycle (from oceans, through rainfall, to rivers) and the Small Water Cycle is given in first 20 minutes of this. And backup of the scientific basis is provided in the dialogue at this.)
- But as the Earth gets hotter, and if low-carbon soils hold less water, some fields are getting too much rain, and other fields elsewhere suffer from drought – the Small Water Cycle becomes overwhelmed.
- If Legislators do not want the climate and carbon storage to affect the Farm Bill, they can be urged to approve soil-regeneration policies because they'll help the water cycle and thereby help preserve amounts of fresh water that farmers and our cities need.

Water-retentive soil helps to slow global heating

- Evaporation of water out of soil, and transpiration of water from plants into the air, help to transfer heat from the soil into the upper atmosphere, where it can radiate into space.
- Media have not discussed that, because computer models of the climate have not yet realistically included the Small Water Cycle, as it will slow present computers too much in running the climate model.

Part 2

Solutions to soil and water problems

That the Farm Bill can help to scale up

Regenerative agriculture nourishes the soil microorganisms, regenerating the soil

- Advocates want the Farm Bill to increase support for soil regeneration

- Farm Action led a Food Not Feed Summit in Washington DC in February 2023
- Senator Booker (NJ), on Agriculture Committee, spoke there

A Farm Bill

- Is enacted at five-year intervals, to create programs and set a budget for the US Dept. of Agriculture (USDA)
- Other subsequent legislation can enlarge or reduce the money pots for the USDA to do things that were budgeted for
  - (2022's IRA did provide added funds for climate-helpful action)
- The present Farm Bill expires September 30, 2023 – but a continuing resolution can prevent some programs from expiring

- Due to ongoing debate, a new Farm Bill is unlikely to pass immediately; it could take weeks or months
  - Chair of House Ag Committee wants to minimize its focus on climate

Titles/chapters of a Farm Bill (% of funding)

I. *Commodity programs* (7%)

II. *Conservation* (7%)

III. Trade

IV. *Nutrition* (76%) – food aid

V. Credit

VI. Rural Development

VII. Research, Extension . . .

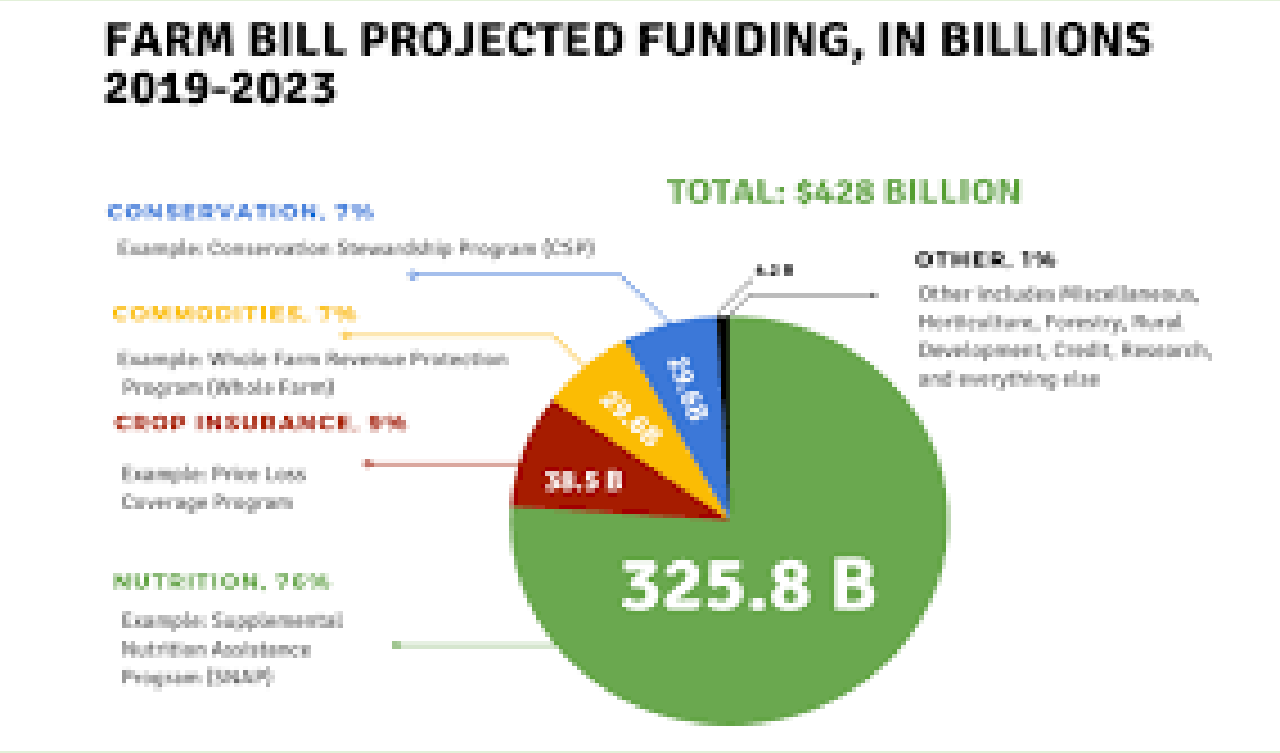
VIII. Forestry

IX. Energy

X. Horticulture

XI. *Crop Insurance* (9%) -

XII. Miscellaneous



The epitome of soil regeneration

Cover Crops

- Usually are seeded in fall, after harvest of the cash crop
- Exude their excess sugars through their roots into soil
- Their remains can be mulched, for control of weeds
- Examples include mustard, *alfalfa, rye*, *clovers, buckwheat*, cowpeas, radish, vetch, Sudan grass, *Austrian winter peas*, *oats*
- Those italicized are sometimes baled or harvested
- In spring, when it's time to plant the cash crop, the cover crop is 'terminated' -- by hotter temperatures, by tillage, by mechanical crimping, or by herbicides

No-till farming

- The soil is disturbed only along the slit or in the hole into which the seeds are planted;
- Residue from previous crops covers and protects the seedbed.
- Conventional no-till agriculture often uses large quantities of selective
- Organic farmers limit herbicide use, by extensively ***rotating crops*** season to season, and interplanting cover crops with the cash crop, to suppress weeds

Crop Rotation

- A field can be planted to corn one year, soybeans the next year.
- Organic farmers might also add a year of hay, a year of barley etc . . . .
- That serves to disrupt the presence of insects and diseases that otherwise might overwhelm the year's cash crop, and
- It adds to the diversity of bacteria and fungi in the soil that can help the cash crop in various ways

Reduced use of herbicides and insecticides

- With diversity of soil microorganisms, there's more likely to be a bacterium or fungus that supplies the unique biochemical that a crop plant needs, to defeat a disease or pest
  - Peralta, Sun,McDaniel, Lennon, "Crop rotational diversity increases disease suppressive capacity of soil microbiomes", Ecosphere, Vol. 9, Issue 5, May 2018

Less chemical fertilizers – profit vs. maximum crop yield

- Less damage to soil's microbes
- Yields per acre do not match the conventional farmers'
- But with less input costs, the regenerative farmer has higher profits per acre (per Kevin Fulton, seen below)
- However – doesn't America need to feed the world, and so shouldn't we have a farm system in which each farmer strives to maximize crop yield per acre?
  - A response: "Only half of one percent of U.S. agricultural exports, calculated according to their value, went to a group of [the most undernourished] 19 countries that includes Haiti, Yemen and Ethiopia ".
    - 40% of corn grown in the USA goes to ethanol for car fuels (electric cars won't need it)
    - Another 40% goes to production of corn syrup for soft drinks and processed foods

A balance of concerns

- Food for undernourished nations can be most effectively increased by "helping people in the hungriest countries do a better job of feeding themselves and ensuring that their farmers make a good living"
- So, farmers of the USA are not obliged to ruin their soils with fertilizers and pesticides, or to plant row crops on land better suited for pasture.
- Some American farmers will choose to use the latest technology,
- But others, like Kevin Fulton and Gabe Brown, are choosing methods that protect the long-run sustainability of their soils; the USDA's budget should support their work, in ways discussed below.

Farmers are maintaining profits with soil regeneration

- Kevin Fulton, of Nebraska
  - Kevin Fulton also can be seen at min.6 in a Farm Action webinar panel "Conservation and Regeneration: Fostering Resilience in the Farm Bill" (May 3, 2023)
- Gabe Brown farms in North Dakota
  - Companies like General Mills pay him to educate other farmers about protecting soil
- "A new Soil Health Institute study shows implementing soil health management practices
  - **increased net farm income** by an average of $65/acre across 30 farms studied,
  - and that **yield increases** were reported for 42% of farms growing corn, 32% of farms growing soybeans, and 35% of farms growing other crops."

Some other practices helpful to soil

- **Perennial crops** – Kernza, from the Land Institute in Kansas
- reduced till; prairie strips
- **Management intensive grazing** - electric fences are frequently moved, to confine a cow or sheep herd to part of a grassland, for optimal use of grass. Also, a herd can graze in a crop field after harvest

- **Agroforestry & silvopasture (trees)** – with shade, some crops get optimal amount of light
- Dry manure management
- Organic fertilizer
- Riparian buffers and wind breaks

USDA can support the marketing of fruits and vegetables

- Fruits and vegetables should have a larger percentage of our diets
- Advantages of local production – select varieties for taste and nutritional value, not for endurance; and save transportation costs
- Supplemental Nutrition Assistance Program (SNAP) is USDA's largest expenditure
  - Its Healthy Incentives program provides discounts etc for healthy foods - some programs allow users to redeem coupons at farmers' markets
- USDA has some pilot programs, The Farm Bill should provide funds to scale up such efforts.
- Young people – can start with small farms

USDA could provide more Subsidies for a farmer's transition period

- A ***transition period of a few years*** is needed, reducing chemical use while the soil's carbon content and microorganism communities improve enough to reduce the need for fertilizers and pesticides.
- The National Resource ***Conservation*** Service (NRCS) runs cost-sharing programs These include:
  - Environmental Quality Incentives Program (EQIP): to solve a problem in a specific part of the farm
  - Conservation Stewardship Program (CSP) : a five-year commitment, it entails the farm's entire operation.
  - Regional Conservation Partnership Program (RCPP) – USDA partners with a state agency or a corporation which 'sponsors' farmers who implement specified work, such as habitat for pollinators

How the 2022 Inflation Reduction Act (IRA) helps soil

- As summarized by a Sierra Club staffer: the IRA authorizes extra funds for these programs I just listed, in addition to existing appropriations in the 2018 Farm Bill itself
  - an extra $1.75 Billion for EQIP in Fiscal Year 2024
    - Regrettably, some of it will go for manure digesters for CAFOs – see below
  - an extra $500 Million for CSP in FY 2024
  - An extra $800 Million for Regional CSP in FY 2024
- And the IRA authorizes even larger increments of funds for these programs in Fiscal Years 2025 and 2026
- *But all of these must be defended from reductions by Congress, as negotiations proceed on a new Farm Bill draft.*

NRCS can support scale-up

- USDA's Natural Resource Conservation Service (NRCS) – its districts should be staffed up for more local guidance on soil regeneration
- "With Ray Archuleta, It's All About the Soil", (on his public speaking after retiring from the NRCS)
- A bill now in Congress: Farmer to Farmer Education Act (bipartisan). "would authorize NRCS to enter into cooperative agreements with community-based organizations in each state that [can] build on established and burgeoning peer-to-peer networks."

Self-help: www.FarmTender.us

- a website for landowners to meet the knowledgeable soil-regenerators, for consulting or for land rentals
- Nominal fee (free enrollment until Sept 30)
- How to register: https://youtu.be/3H_HKx8GDT4
- How to search: https://youtu.be/GXKCEQTGcJE

Section 3: What is impeding the needed changes to the Farm Bill?

- Status quo farming practices are continuing the soil damage
- Excessive allocation of land to corn, soybeans, and sugar
- U.S. Dept of Agriculture subsidies make these crop habits hard to alter.

Organized opposition to present farm subsidies

- A broad-based coalition (including the Environmental Working Group and U.S. PIRG) recently signed a letter of opposition to any increases in farm subsidies.[4]
  - And the Heritage Foundation, which has questioned farm subsidies for years, adds political breadth in opposition to subsidies
- But there is always strong lobbying to continue the subsidies

Who benefits from excessive production of corn and soybeans?

1. Corn and soybeans are cheap feed for huge Concentrated Animal Feeding Operations (CAFOs), boosting their profits
   - Thousands of animals at a site, crowded into pens
   - Fed antibiotics to limit diseases
   - Manure spread on fields; ammonia fumes and nutrient runoff
2. Processed food makers get corn sugars at low cost. low-nutrition foods are produced. (Our food consumption does not match well against dietary standards.)

Who benefits from excess corn and soybeans, cont.

3. Oil and gas companies sell inputs for production of
   - nitrogen fertilizer,
     - Nature: "Reducing overall production and use of synthetic nitrogen fertilisers offers large mitigation potential and in many cases realisable potential to reduce emissions."
   - herbicides, and insecticides
     - NIH, Nov. 2022: "the admixture of PAHs **[hydrocarbons]** in pesticides can be **highly carcinogenic or toxic** in the long term, **even more than the declared active ingredient** itself. "

Other beneficiaries of the status quo

- 4. Producers of diesel fuels for tractors that till the soil
- 5. ‘Companies offering drones and artificial intelligence systems, to search for and destroy weeds
  - i.e. ‘not a single weed shall violate the uniform appearance of my monocrop field’

Yet we persist: Problems and Opportunities,

- Some Allocation issues
  - Prices for commodity crops
  - Crop insurance

Commodities

- 7% of Farm Bill's spending has been on commodities – to maintain stable and adequate prices for high-volume crops – corn, soybeans, wheat, rice, cotton, peanuts
- Some in the House of Representatives want to shift some money out of Conservation programs, into Commodities (by raising "reference prices")
- Successful Farming journal reports: most of the change's benefits would go to 6,000 farms that raise rice, cotton, and peanuts

The Federal Crop Insurance Program

- 1930s onward: insurance for losses from weather and pests
- 1994 onward: farmers can also buy protection from ***losses due to falling prices*** -- with risk of losses removed; safe and dependable income is gained with monocrops (corn, soybeans, wheat, rice, sugar, cotton) without a lot of paperwork
- Corn and soybean farmers who buy costly Genetic Modified seed must get operating loans from banks; banks require crop insurance as security for loans

The Federal Crop Insurance Program, cont.

- *Subsidizing* crop insurance is the second biggest cost for the USDA (9%) -- USDA pays 62 percent of farmers' insurance premiums
- Climate problems are causing increased crop losses that this insurance pays for

Some of the problems with Crop Insurance

- ***Eligibility for benefits*** requires compliance with Good Farming Practices, which have not been updated to adequately include soil regeneration practices
- "How Crop Insurance Keeps Some Farmers From Adapting to Climate Change "
  - "Any practice that "could affect the amount and quality of the crop" can potentially violate the Good Farming Practices, according to guidance from the USDA's Risk Management Agency (RMA)."
  - "Farmers can be penalized for under-fertilizing, under-watering, keeping a cover crop in the ground for too long, and not growing in distinct rows . . . "

Another problem with Crop Insurance

- Soil-regenerating farmers will have smaller losses and should pay lower premiums
  - ***Insurance premium formulas*** should account for the risk reduction (e.g. less flooding) that good soil management brings
- National Sustainable Agriculture Coalition, "2023 Farm Bill Platform", in Ch. XI urges improving insurance access for underserved producers.

A rising problem: Methane digester subsidies for CAFOs

- Concentrated Animal Feeding Operations (CAFOs) are causing 8% of methane emissions.
- They can use Anaerobic digesters of manure that separate
  - methane (for pipelines or local use)
  - from solids (for fertilizer – but too full of nutrients)
- This is earning tax credits
-

Unintended consequences of the methane digester credits

- - CAFOs are enlarged – to get big enough to use a digester
  - CAFOs locate the digester near a disadvantaged community, for a credit add-on
  - Useful lives of CAFO facilities will be lengthened, to amortize the cost of the digester
- So, Farm Bill should reduce incentives for methane digesters
- [Sept 18: Neighbors of CAFOs in MINN are suing the EPA to better protect waters from excess manure runoff

Another Problem, for 2028: Biofuels

- The US ethanol program consumes 40 percent of the corn harvest, and 7 percent of soybean harvest, which
  - pushes up food prices.
  - Motivates cultivation of marginal land which should be dedicated to conservation
  - “in developing countries, smallholder farmers growing food for their families are forced off their land to make way for energy crops for export.“
- Sen. Feinstein: "It's time to end the mandate and instead support more advanced biofuels and biodiesel that won't contribute to climate change or drive up the cost of food.”
  - E.g. hemp --- which also builds deep roots, for strong carbon sequestration

Opportunity: Agrivoltaics

- crops and livestock can be raised underneath elevated solar panel racks (which are routinely designed to withstand 150 mph winds)
- The partial shade reduces heat stress and water consumption
- the green plants still receive enough light rays, of the right frequencies, for optimal growth.
- Fruits, vegetables, pollinators, and farm workers also can benefit from the partial shade
- The solar panels produce more electricity than they would be if heat-reflective gravel (often sprayed with herbicides) is underneath them.

“Marker Bills”

- **Currently Filed in Congress**
- **a way to advocate for changes or additions to the draft of the Farm Bill**

. . . For Food, not Livestock Feed

- S.1205/H.R.2723 Local Farms and Food Act of 2023 (bipartisan) NSAC outline. Includes support for farmer markets and food hubs.
- Strengthening Local Processing Act of 2023 (bipartisan, S.354/H.R.945) - small meat and poultry processing plants
- Opportunities for Fairness in Farming Act of 2023 (bipartisan, S.557/H.R.1249). OFF Act Fact Sheet (Farm Action) Farmers and ranchers are being forced to pay into checkoff programs for their commodity, which too often support food system consolidation. This legislation would prohibit certain practices.

Ending Agricultural Trade Suppression (EATS) Act.

- aims to strip state and local governments of their right to make policies around the production and manufacture of agricultural products within their own borders.
- A response to a California statute
- But a bill like EATS was blocked from inclusion in the 2018 Farm Bill
- A broad coalition of organizations and legislators are opposing this EATS Act

Nationwide conversations about Food and Agriculture are needed

- Farm Bill for American Families has a large group of sponsors who would appear to have interests in maintaining the status quo,
- So all Americans who eat food and are hurt by climate change need to give attention to the need for regenerative agriculture
- As Congress drafts and cast votes for the Farm Bills of 2023 and 2028, we must be conscious of what is at stake.
- Experts are telling Congress's staffs why the Farm Bill needs to be reformed; but rural and urban voters need to communicate our concerns to Congress, so they'll have the will to vote for changes they know to be necessary.