

*Environmental and Energy Study Institute
Briefing to the House Select Committee on the Climate Crisis*

LEGAL PATHWAYS TO DEEP DECARBONIZATION IN U.S. AGRICULTURE



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CLIMATE CHANGE HARMS AGRICULTURE

PESTS, WEEDS, DISEASES

- More optimal living conditions for pests, parasites and fungi
- Invasive species expand and spread
- Reduced resilience to disease outbreak



EXTREME WEATHER

- Hurricanes and storms increase in frequency and severity
- Hurricane Maria: \$780M in ag losses
- CAFO overflows



HEAT WAVES AND WILDFIRES

- More frequent and severe
- Lead to yield declines
- Dangerous working conditions

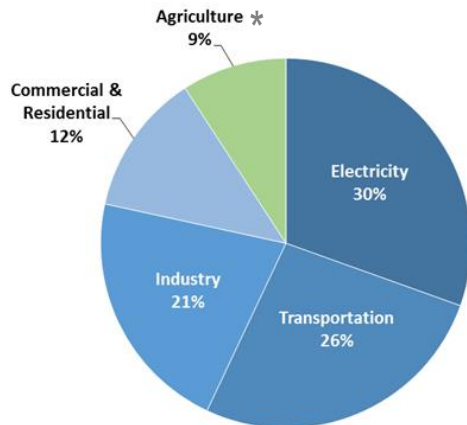


FLOODS AND DROUGHTS

- Irregular and extreme precipitation events more frequent and severe
- 2016 CA Drought: \$603M in ag losses
- 2019 Midwest floods: 5-10M bushels corn and soy rotted; 19M acres left unplanted



INDUSTRIAL AGRICULTURE CONTRIBUTES TO CLIMATE CHANGE



* Does not include GHG from land conversion, foregone sequestration; additional food system emissions from processing, refrigeration, cooking, transport, etc.

NITROUS OXIDE

- Excess fertilizer, animal manure
- ~73 coal-fired power plants



SOIL CARBON

- Forest and grassland conversion, tillage
 - ~17 coal-fired power plants
- **7.8M+ acres** converted to cropland from 2008-2012



METHANE

- Cattle, animal manure
- ~87 coal-fired power plants
- Equal to emissions from entire oil and gas sector



CARBON DIOXIDE

- Fertilizer manufacture, on-farm energy, food waste in landfills
 - ~12 coal-fired power plants

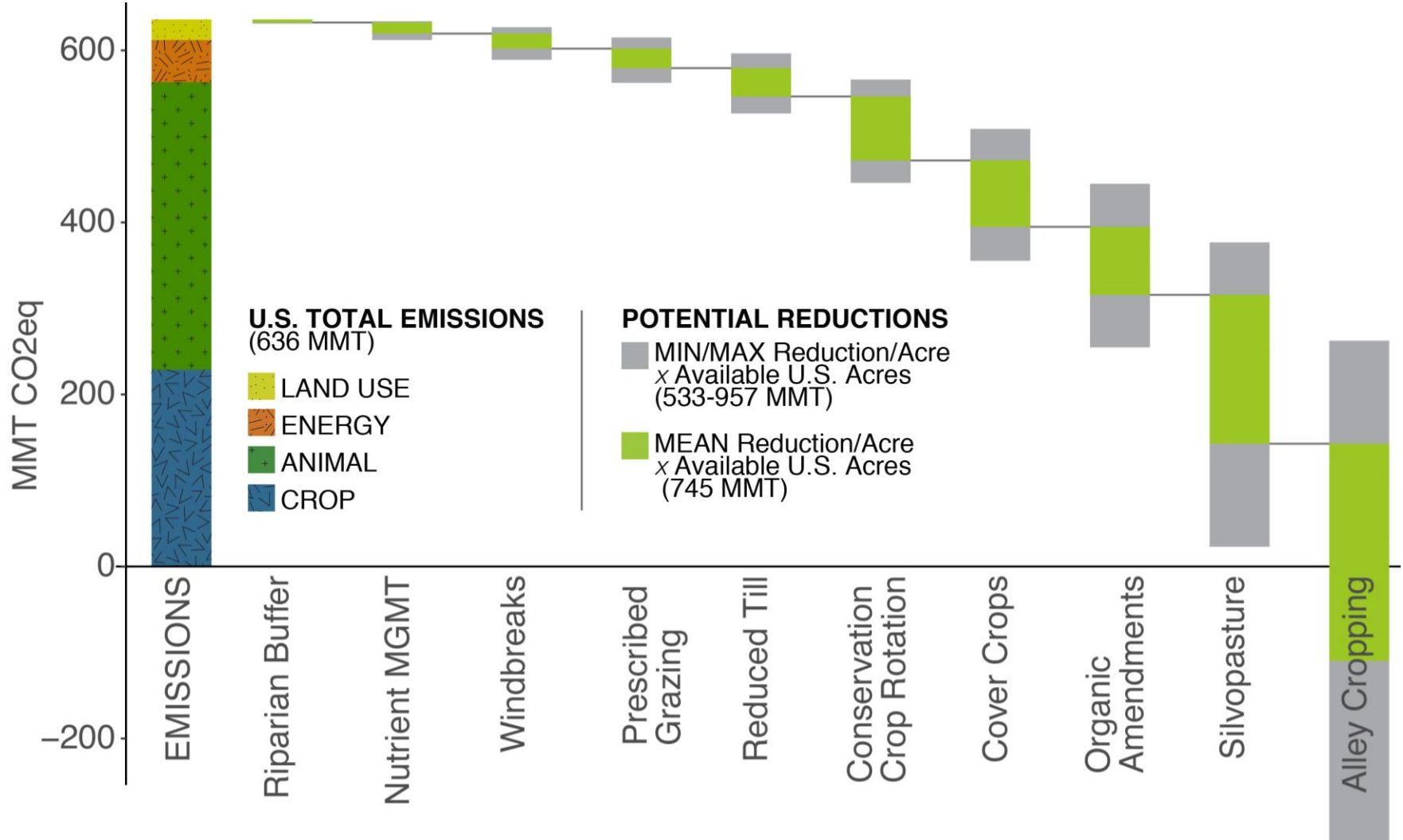
AGROECOLOGICAL PRACTICES REDUCE CHEMICAL USE, POLLUTION, CLIMATE IMPACTS



Annual crop root mass (left) vs. perennial crop root mass (right).
Greater root mass improves drought/flood resilience and nutrient uptake.

- Chemical-intensive, monoculture systems increase erosion and GHG emissions and are not necessary for high productivity and profitability
- **Organic and agroecological practices can provide ample nutritious food** while reducing fertilizer/pesticide needs and costs
- These proven practices include:
 - Perennial crops (*see image*)
 - Crop rotations (different yearly crops)
 - Cover crops (avoiding winter bare ground)
 - No-till, reduced till; prairie strips
 - Management intensive grazing
 - Agroforestry & silvopasture (trees)
 - Dry manure management
 - Organic fertilizer
 - Riparian buffers, wind break:

CARBON NEUTRAL FUTURE: BETTER PRACTICES CAN ACHIEVE CARBON NEUTRAL AGRICULTURE



ALTERNATIVE PRACTICES NEED INCENTIVES TO INCREASE ADOPTION

- Agroecological practices are very effective, but not widely employed
 - **Universal barriers include:** knowledge and capacity, technical and technological support, lack of site- or region-specific information, cultural attitudes, financial risks and opportunity costs...
 - **>85%** of USDA survey participants would NOT adopt structural conservation practices without outside funding

PRACTICE	U.S. ADOPTION RATE
Cover crops	~4% of all cropland acres
No-till	26% of all cropland acres*
Fertilizer management	6% of corn and 24% of cotton acreage meet all 4 criteria for good nitrogen management**
Crop rotations (>2 years)	~11% of all cropland acres
Residue grazed by livestock	12% of corn acreage
Certified organic	<1% of all US farms

*Less than a third of “no-till farms” are truly no-till.

**No fall application, optimal rate, some N after planting, incorporated below soil surface

POLICY RECOMMENDATIONS TO ACCELERATE CARBON NEUTRAL AGRICULTURE

1. **Eliminate policy barriers** to adoption of agricultural land management practices with climate change mitigation potential
2. **Incentivize practices** with climate benefits
3. Increase funding for **research and development**
4. Improve **education, outreach and participation** through federal programs
5. Address **related laws and programs** affecting climate change and resiliency

STATUTORY CHANGES NECESSARY FOR CARBON NEUTRAL AGRICULTURE

- **The Farm Bill**

- Expand and better target **conservation programs** to practices with climate change mitigation and resilience potential and away from practices with negative impacts
- Increase funding for **R&D** into climate-friendly practices, education, & outreach
- Reform **crop insurance and commodity payments** to avoid barriers to climate-friendly practices and create additional incentives

- **Energy policy and laws**

- Fix **renewable fuel standard** to reduce conversion of native grasslands to cropland
- Encourage **on-farm renewable energy** and energy efficiency

- **Pollution and land management statutes**

- Eliminate barriers and create incentives for management intensive grazing
- Increase information sharing and data availability
- Prioritize climate beneficial practices in other water and air quality programs (e.g. nonpoint source)

RECOMMENDATION 1: ELIMINATE BARRIERS TO ADOPTION OF CLIMATE-FRIENDLY PRACTICES



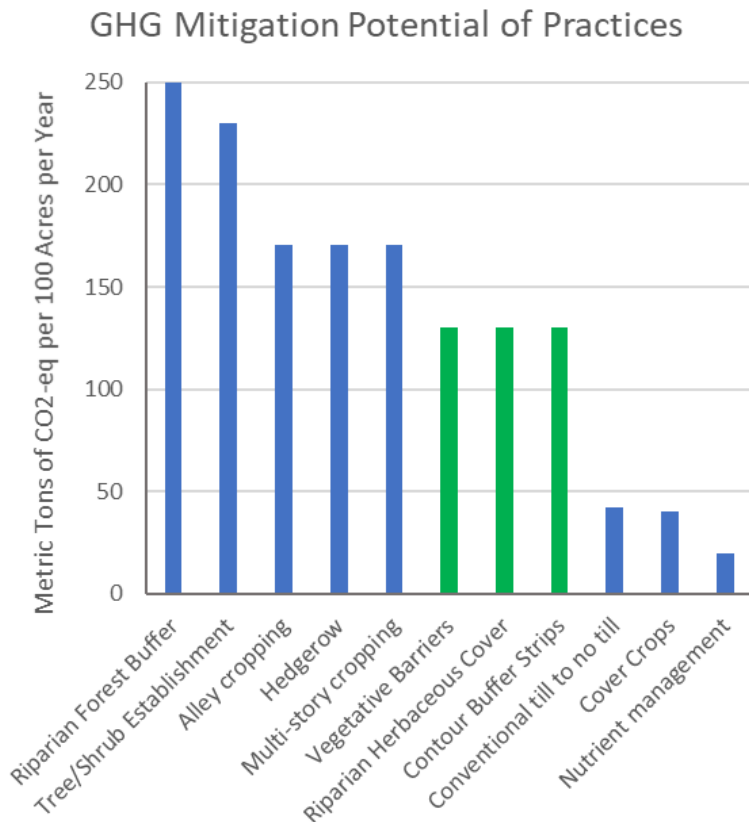
- **Reform crop insurance and commodity payments**
 - Ensure payment calculation methods do not discourage conservation rotations, cover crops, perennial crops
 - Incentivize and do not impede risk minimization practices (i.e. climate resilience)
 - Improve process for including climate-friendly practices in "good farming practices"
- Permit and encourage **management intensive grazing on federal land**
 - Amend rules that currently lead to overgrazing; encourage forage growth

RECOMMENDATION 2: SHIFT INCENTIVES TOWARD CLIMATE FRIENDLY PRACTICES



- Leverage/expand existing programs
- **Environmental Quality Incentives Program (EQIP)**
 - Funded projects often counter-productive (NRCS review) or impede broader shift to agroecological practices (irrigation, CAFOs)
 - Prioritize climate-friendly practices
 - Allocate larger share of funding to practices that reduce GHG
- **Conservation Stewardship Program (CSP)**
 - Raise payment rate for conservation activities with climate change mitigation potential
 - Enhance opportunities for perennial crops

RECOMMENDATION 3: INCENTIVIZE VEGETATED BUFFERS AND EASEMENTS



- One third of riparian areas not protected, yet have highest conservation value
- **Conservation Reserve Program (CRP)**
 - Often only temporary benefits; accumulated soil C lost when CRP contracts expire and land put back into production
 - Offer longer-term agreements to keep land out of production and hold accumulated soil carbon longer
 - Expand and encourage use of 30-year contracts allowed by 2018 Farm Bill basis
 - Focus on land with greatest climate benefits
- Congress and States can expand **Agricultural Conservation Easement Program (ACEP)**

RECOMMENDATION 4: INCREASE FUNDING FOR RESEARCH AND DEVELOPMENT



- Research & outreach funding half of prior years & largely supports conventional ag
- **Fund R&D** of monitoring & measurement technologies and methods, including remote
- Increase investment for **USDA Climate Hubs** research and other USDA entities
- Increase funding for **Conservation Innovation Grants, Agroforestry Centers, On-Farm Soil Health Demonstrations**
 - Create explicit category for climate change mitigation & resilience

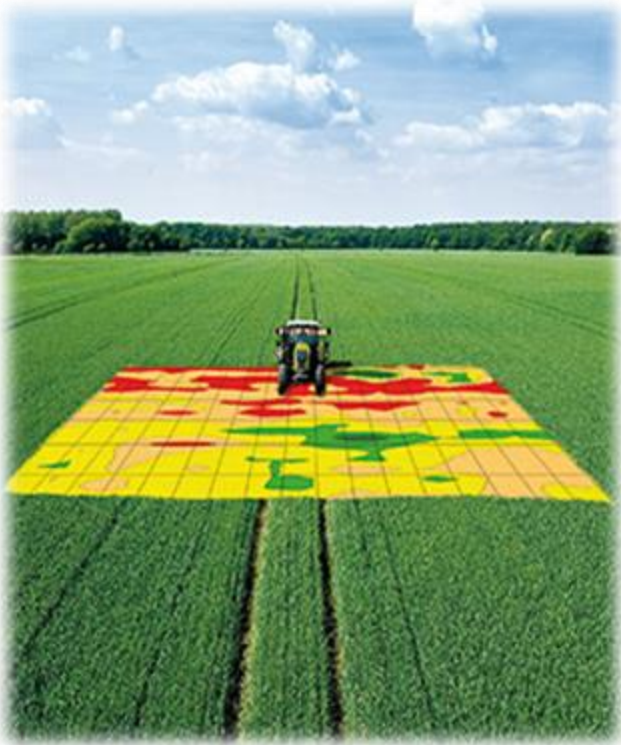
RECOMMENDATION 5: IMPROVE EDUCATION, OUTREACH AND PARTICIPATION



*NOFA-NY field day at
Poughkeepsie Farm Project (2018)*

- Knowledge, information and capacity is major barrier for all practices
- Restore and increase funding, now far below previous levels; cannot depend on private sources of technical assistance
- Increase funding for **educational and technical support** from:
 - NRCS Conservation Technical Assistance program, agents and offices in each county
 - Farmer-to-farmer networks
 - On-farm demonstrations and workshops
- Establish national “**Soil Health Champions**” program to expand peer-network learning

RECOMMENDATION 6: OTHER LAWS AND PROGRAMS TO REDUCE GHG



- Increase support and eliminate barriers for other practices that reduce GHG:
 - Improved livestock manure management, e.g. switch from **wet to dry manure management**
 - New **on-farm technology** (remote sensing, precision agriculture, etc.)
 - New climate resilient **crop and feed varieties**
- Encourage and incentivize on-farm **renewable energy & energy efficiency**
- Reform “aggregate compliance” in **renewable fuel standard** to slow grassland conversion
- Address food waste

State Healthy Soils Laws and Bills									
State	Water Goal	Climate Change Goal	Other Goals	“Healthy Soil” Definition	Specific Practices Identified	Committee/ Task Force	Research and Education	Technical Assistance	Funding
CA	✓	✓	Yields, erosion, air	✓	No-till, cover crops, compost, grazing	✓	✓	✓	\$7.5 M
HI	✓	✓	Resilience, trading	✓	Compost, agroforestry	✓	✓	✓	\$25,000 for study
MD		✓	Yields	✓		Dept. of Ag.	✓	✓	
OK		✓	Trading		Trees, conservation, re-vegetation	✓	✓	Measurement	Creates fund
VT	✓	✓	Climate resilience	Performance based	No synthetic chemicals	✓		Certificate	Marketing program
UT	✓	✓	Productivity, biodiversity		Advance forestry, grazing	✓		“Encourages”	
IL	✓		Climate resilience	✓	Perennials				Soil and Water Cons. Districts
NE	✓	✓	Profitability, resilience	✓	Cover crops	✓			\$20-40/acre for cover crops
NM			Yields, profitability	✓	No-till, cover crops, compost, mulch, grazing	✓	✓	✓	\$5.15 M
WA		✓	Profitability, energy use	Carbon farming	Trees, no-till, cover crop, grazing	✓			Creates fund
OR		✓	Erosion, resilience			✓			Cap-and-invest
CT	✓		Erosion	✓	No-till, cover crops, grazing, integration	✓	✓	Training	Creates fund
IA					Cover crops		✓		Tax exemption for cover crops
NY	✓	✓	Yields	Carbon farming	Refers to COMET-Planner		✓	Certificate	Tax credit
MA		✓		✓	No-till, cover crops, grazing, integration	✓	✓	✓	Creates fund