Resilient Properties in the Current Food System

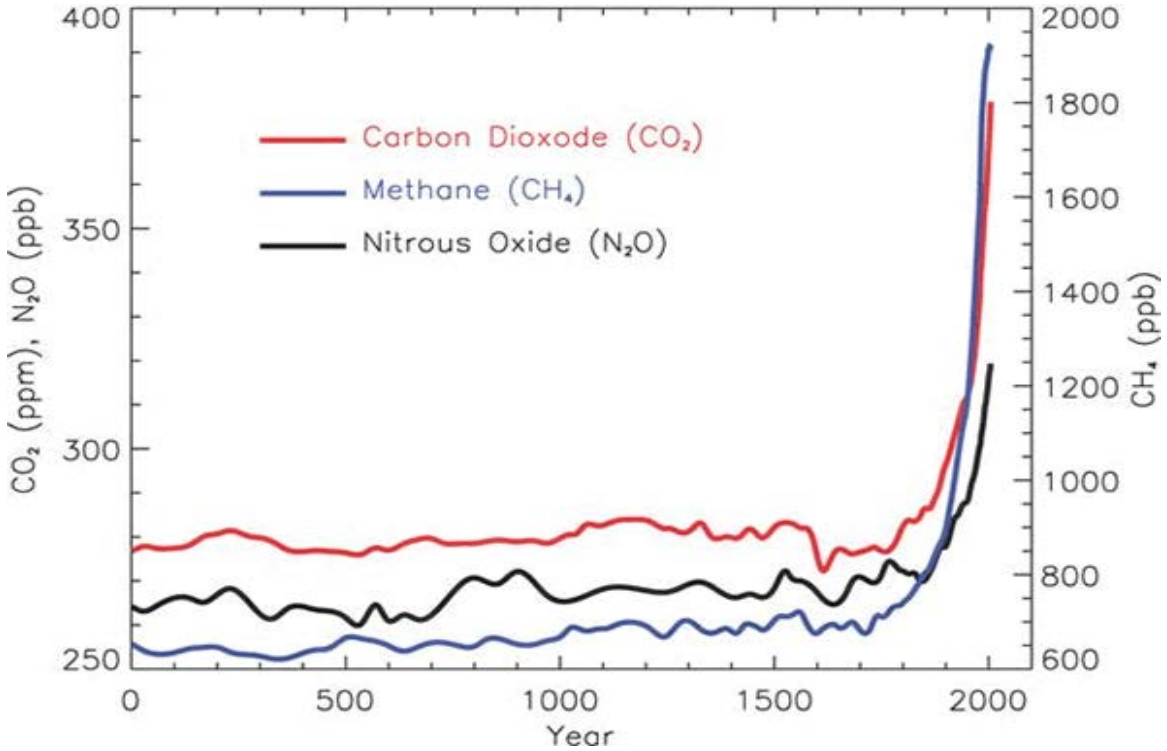
Dr. Cynthia Daley, Director for the Center for Regenerative Agriculture & Resilient Systems

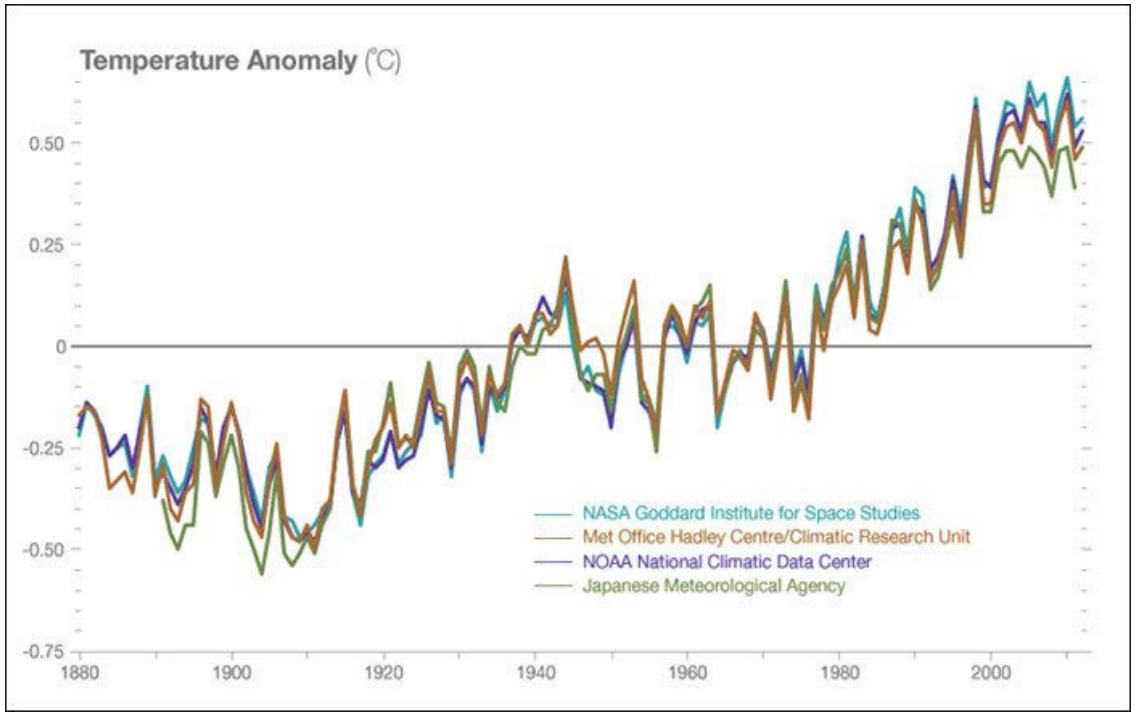
---

CSU, CHICO CENTER FOR REGENERATIVE AGRICULTURE

This is what resiliency looks like.

Living in a time of crisis



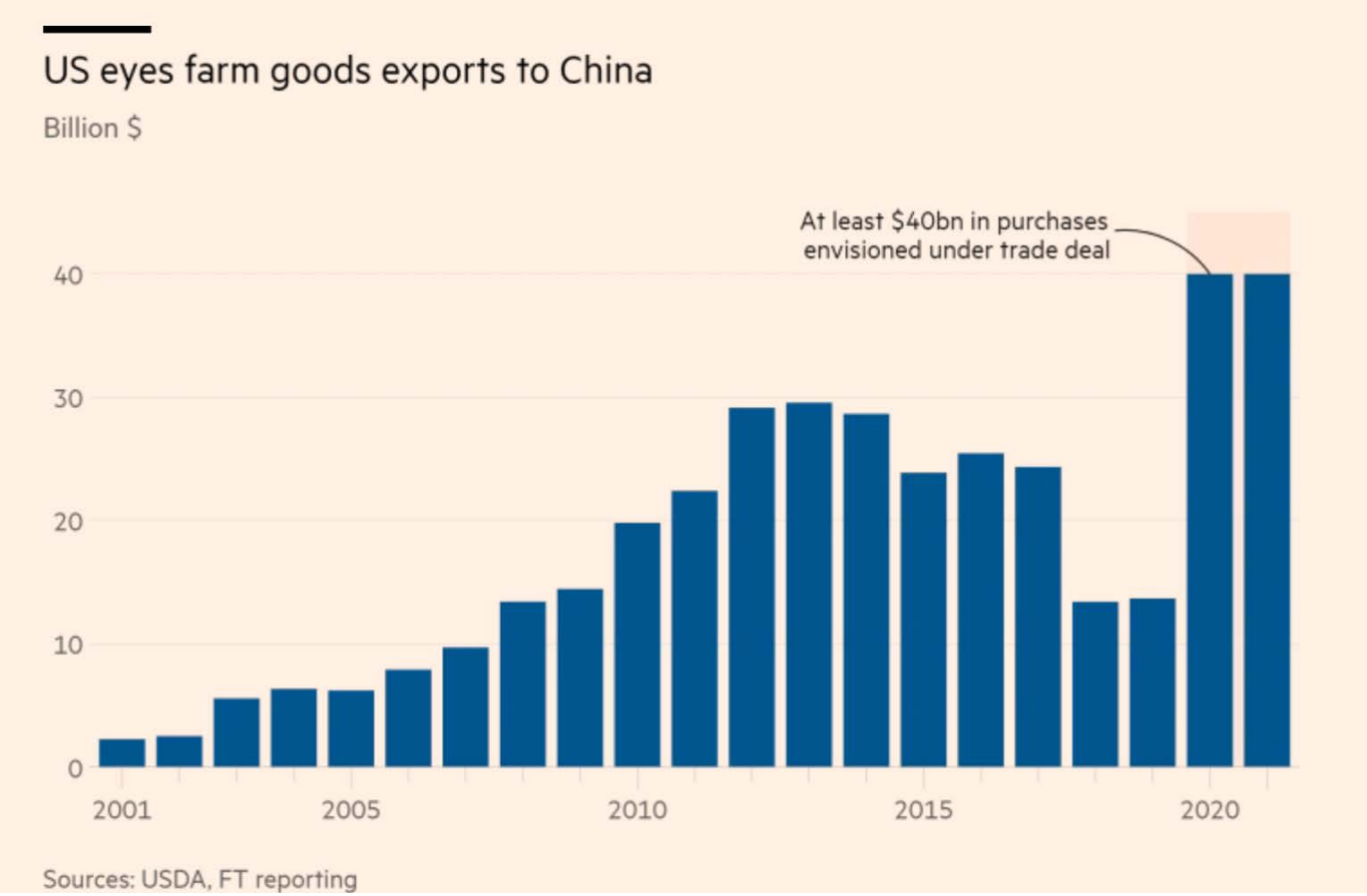


Climate Change impacts on Agriculture

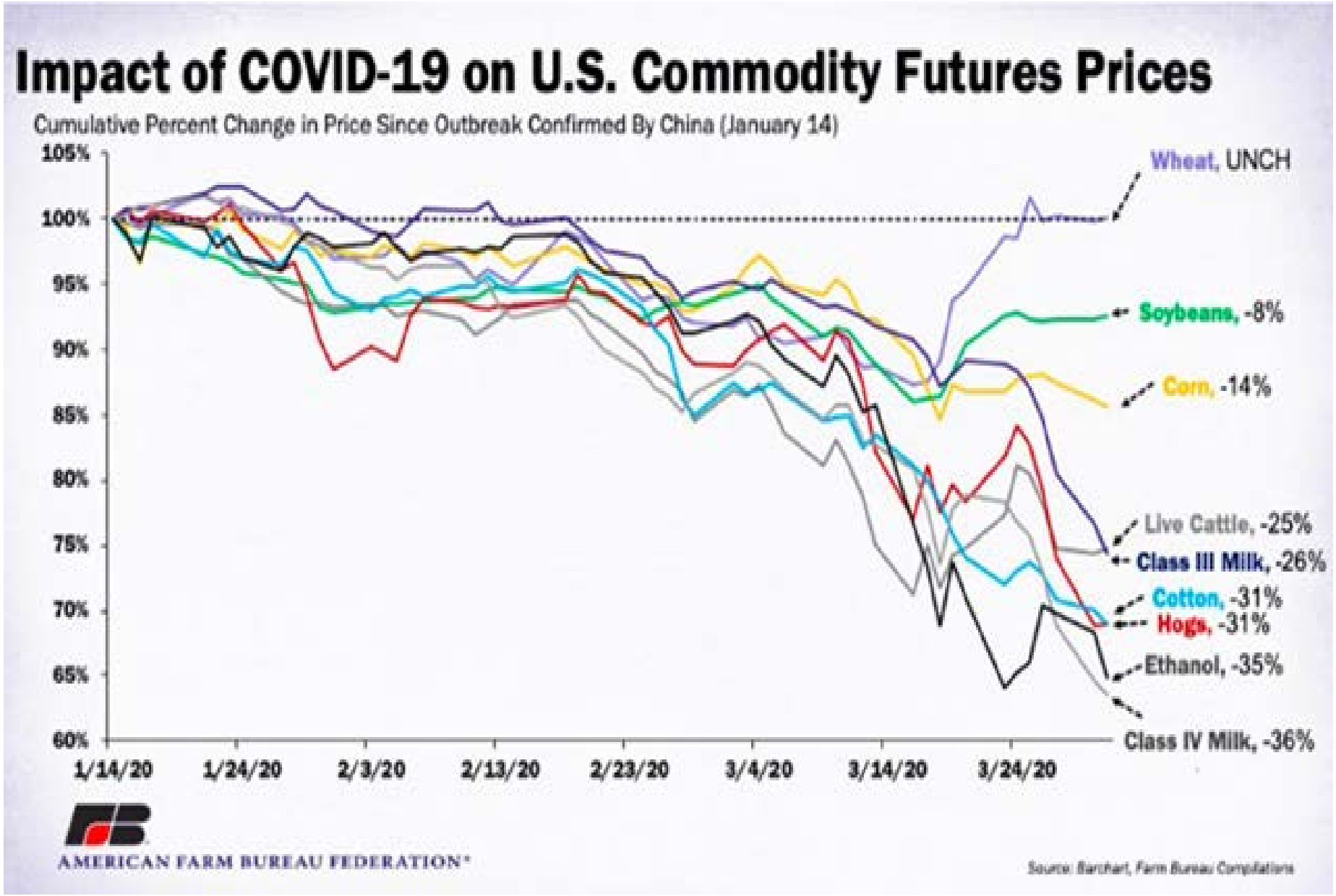
Farmers are among the most vulnerable:

- More floods;
- More droughts;
- New pests;
- New pathogens;
- New weed problems
- Declining yields
- Economic distress

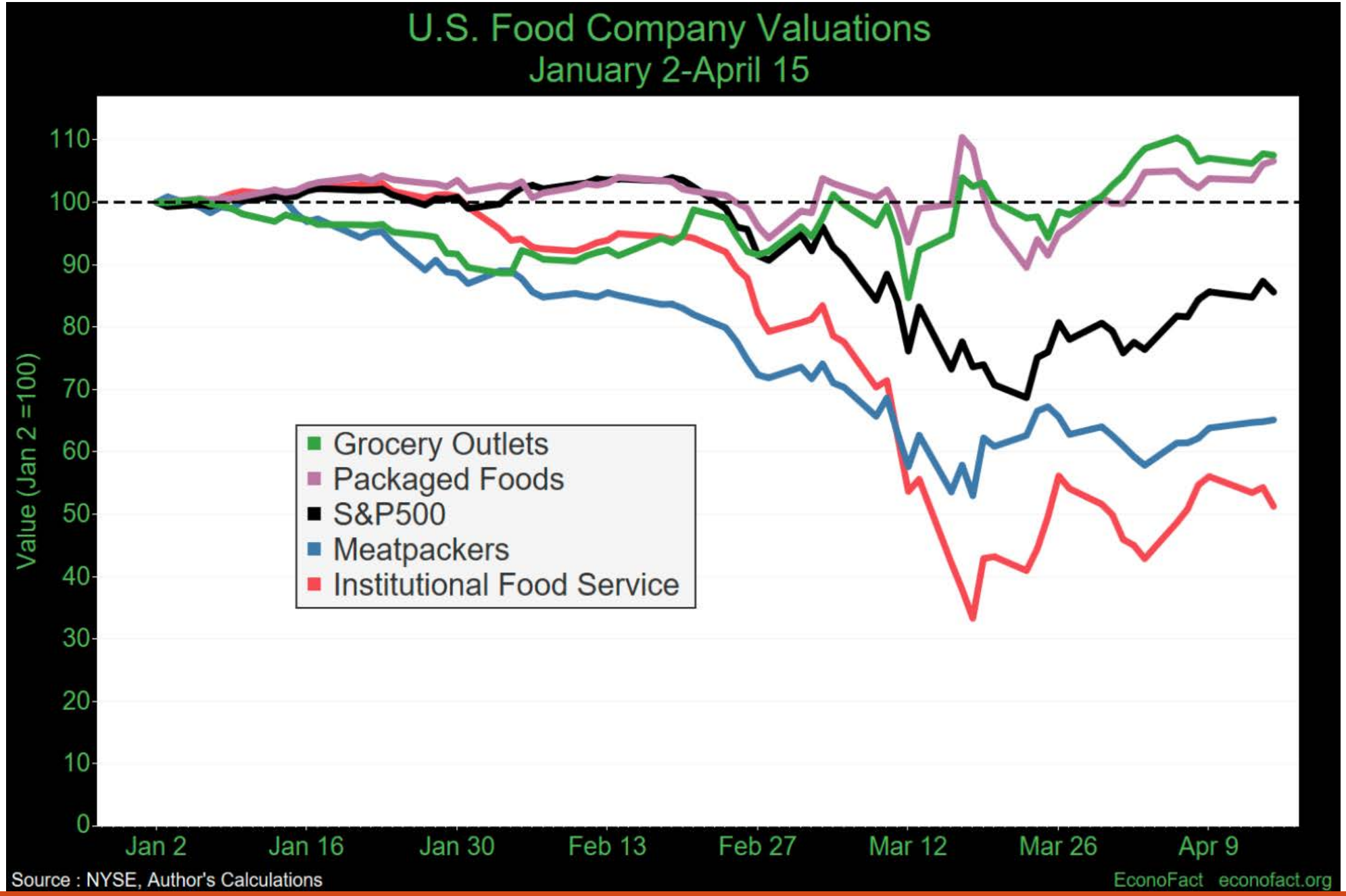
Trade wars impact on farmers



COVID-19 Impacts on Commodity Prices



COVID-19 Impacts on Food Industry

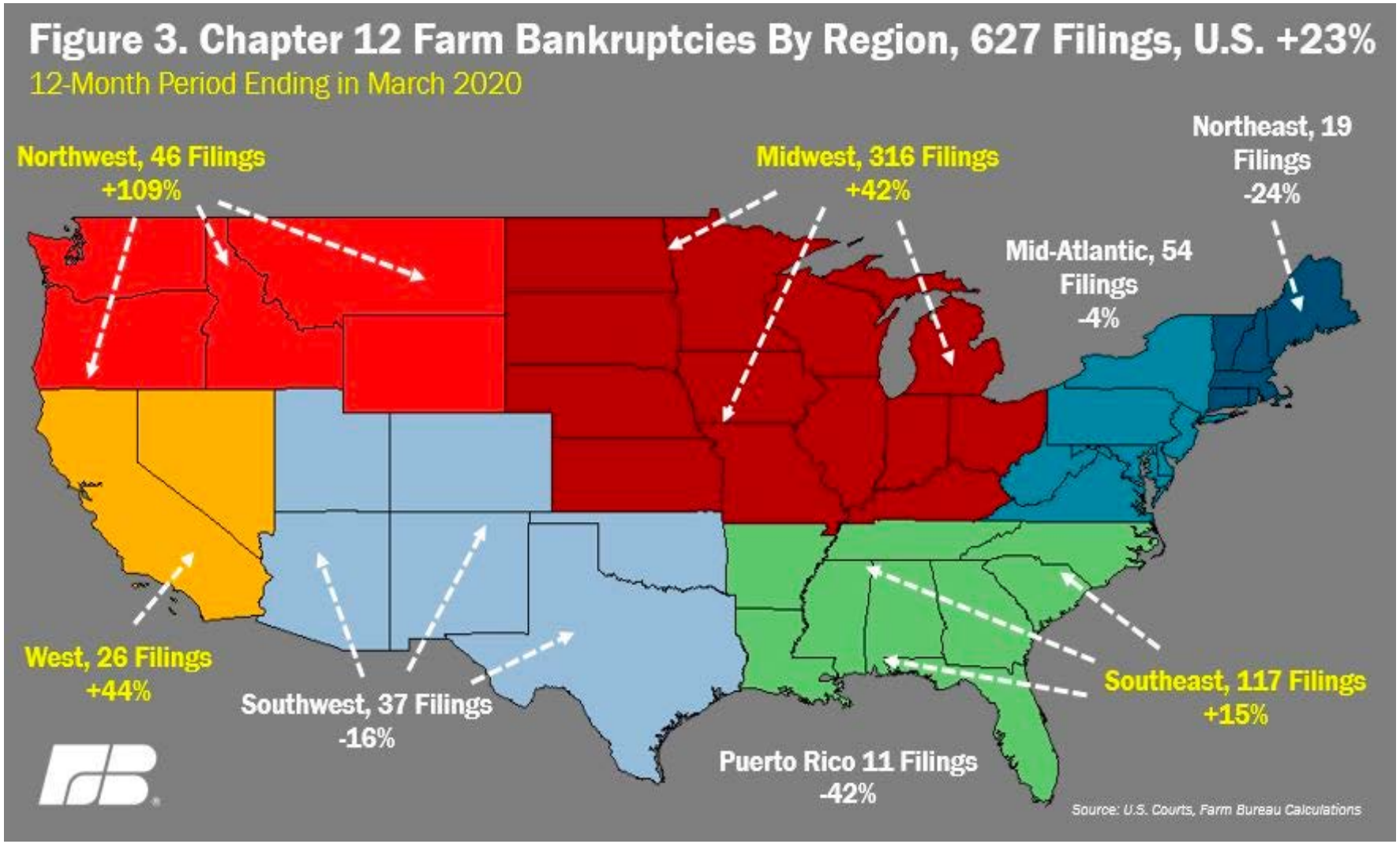


https://econofact.org/covid-19-impacts-on-agriculture-food-and-nutrition

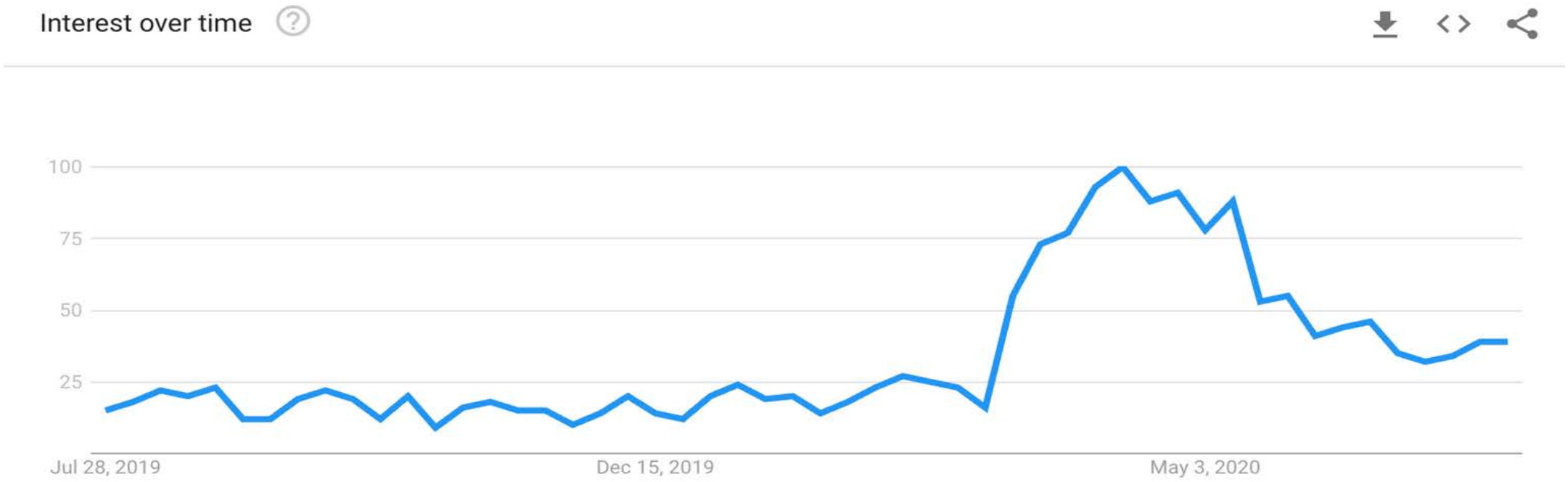
Perishable Commodity Crop Producers Hit the Hardest

Lack diversity and couldn’t pivot to alterative markets.

COVID-19 pushes Farm Bankruptcies Higher



LocalHarvest.com 7,000 CSA's across US



The Counter: https://thecounter.org/csa-sales-struggling-before-coronavirus-covid-19/

Sloot Family Farm – Winthrop MN
600 hd hogs/year

Pre COVID – marketed live hogs through Tyson Foods - commodity pricing – price taker

Post COVID – processing with a Mennonite business; outsourced cutting/wrapping to small local business ; selling all on-line (within a week)

"We're getting a lot of contact from customers who want to source their food directly," Mr. Sloot said. "It got people's attention when they went to the grocery store and saw empty shelves. It's one thing to run out of toilet paper; it's another when you can't feed your family anymore. They want to make sure they know where they can get their food."

White Oak Pastures - Georgia

Vertically integrated

Market direct to consumer

Diversity (beef, goats, lamb, pork, turkey, chicken, duck, goose, guinea and rabbit)

Operate at scale (3,500 ac)

Manage holistically

One Hundred Thousand Beating Hearts – Watch it.

Recipe for a Resilient Farmer – state of mind

1. Adapt to change *(Definition of Insanity)*
2. Stay out of debt
3. Understand your market
4. Manage for diversity *(All your eggs in one basket)*
5. Manage holistically *(Understand context and whole)*
6. Manage stress *(Zen farming)*

Qualities of a Resilient Food & Farming System

1. Farmers are rewarded for good stewardship
2. Doesn’t require massive debt
3. Parity pricing – Economic stability
4. Builds soil carbon/water efficient
5. Diverse markets / competitive pricing
6. Supports local economies and rural communities

Hidden cost of cheap food

1% of topsoil lost every year (NRCS 2015)

24% of GHG emissions (FAO, 2017)

Nitrate leaching – impacting water quality (EPA)

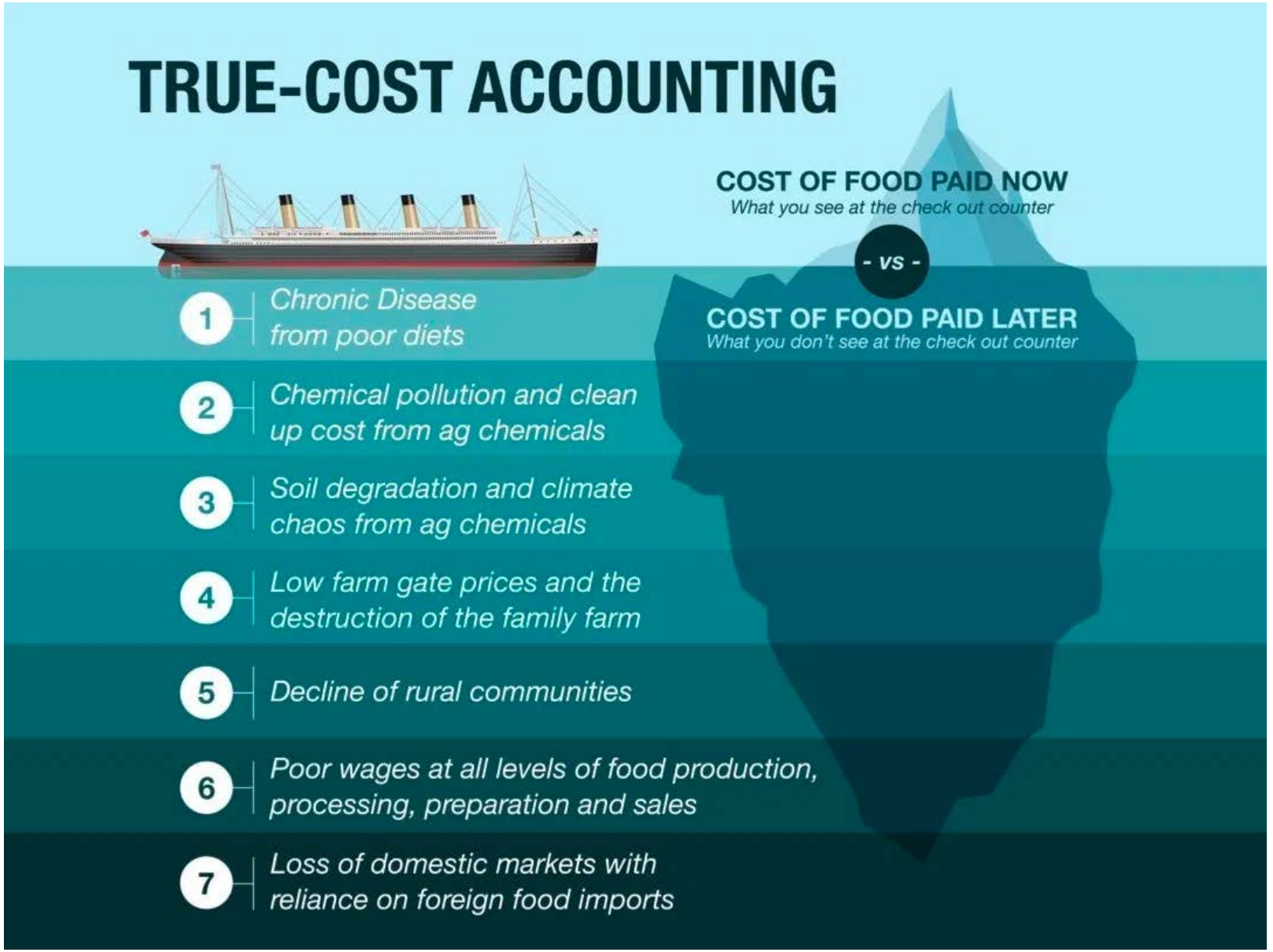
Losing our farmers due to bankruptcy and suicide (CDC)

Nutrient density of food (fruit/veg) has declined. (Davis, 2009)

Species diversity loss – pest damage is up

On True Cost Accounting & The Future of Food

https://futureoffood.org/on-true-cost-accounting-the-future-of-food/



Disconnect between efficiency *(what we have)* **and resilience** *(what we need)*

Regenerative Farming practices that build resiliency

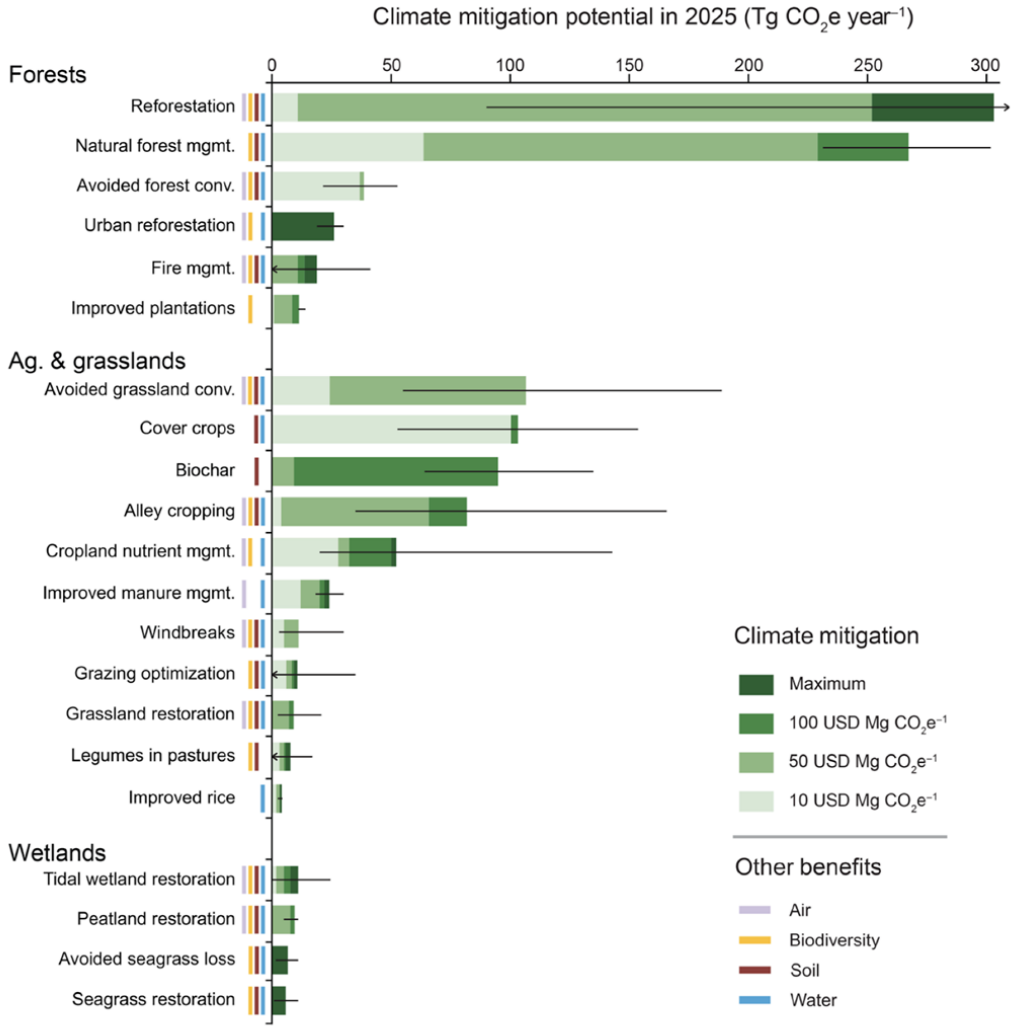


Fig. 1. Climate mitigation potential of 21 NCS in the United States. Black lines indicate the 95% CI or reported range (see table S1). Ecosystem service benefits linked with each NCS are indicated by colored bars for air (filtration), biodiversity (habitat protection or restoration), soil (enrichment), and water (filtration and flood control). See the Supplementary Materials for detailed findings and sources.

Relative Benefits of Regenerative Farming Practices

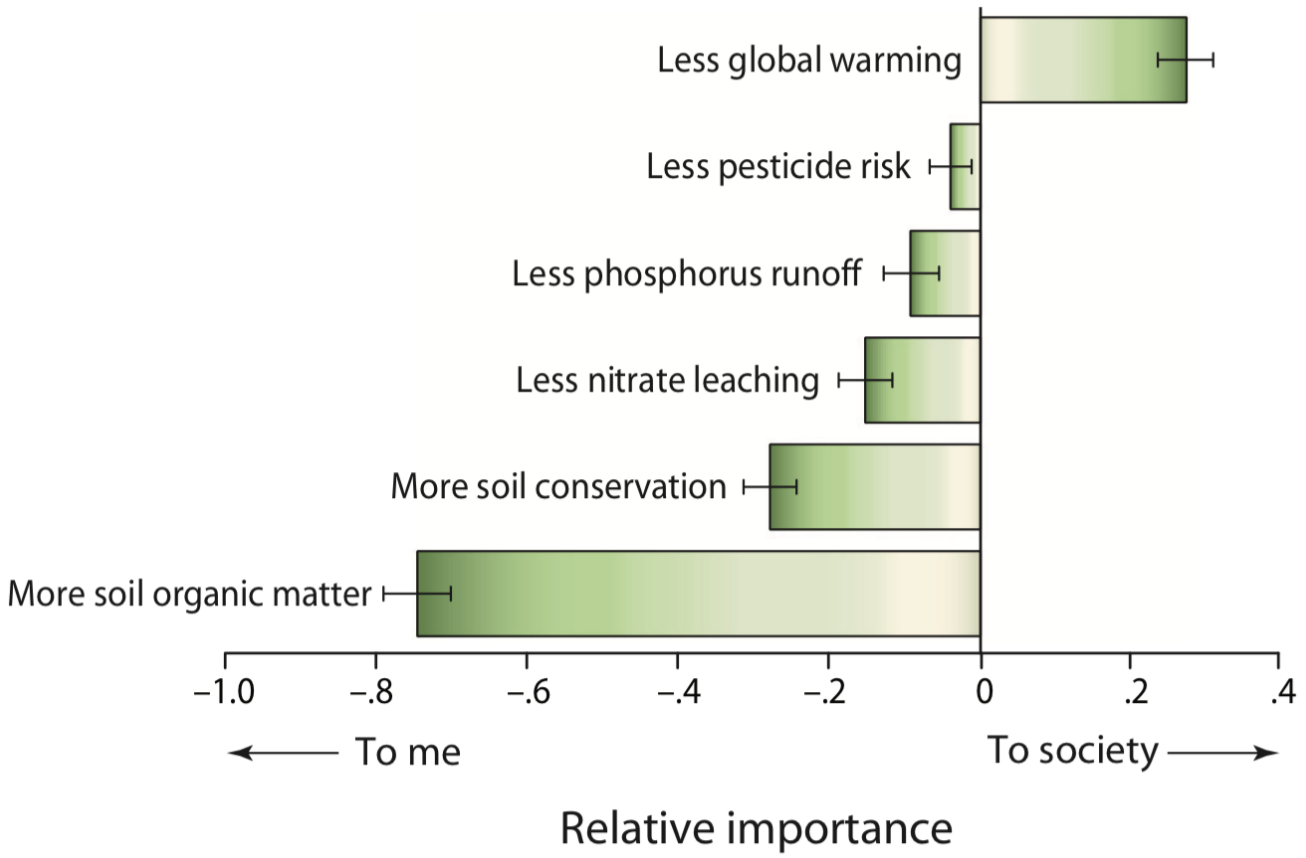


Figure 7. The relative importance to Michigan farmers and to society (as ranked by the farmers) of various environmental benefits potentially provided by agriculture. Source: Adapted from Swinton and colleagues (2014a).

Swinton, et al., 2014. The Ecology of Ag Ecosystems: Long-Term Research on the Path to Sustainability. Oxford University Press.

Resilient Qualities of our Existing Food System

Natural Resource Conservation Programs
- Environmental Quality Incentive Program
- Conservation Stewardship Program

CDFA Healthy Soils Program
- $22 million invested in regenerative farming practices
- 30,000 acres

SWEEP State Water Efficiency and Enhancement Program
- Irrigation efficient technology
- Reduce on-farm energy consumption

Cover Crops, Green Manure & Crop Rotation

Compost and Animal Manures.

No-till & Low Disturbance Tillage

Managed Grazing

Every 1% increase in SOM holds an additional 20,000 gallons of water/acre

Regenerative farming practices build resiliency in our food system

"A mere 2% increase in the carbon content of the planet's soil could offset 100% of all greenhouse gas emissions going into the atmosphere..."

Dr. Rattan Lal , Ohio State University Soil Scientist

Center for Regenerative Agriculture & Resilient Systems

Purpose

- **Sequester** carbon in the soil
- **Rebuild** biodiversity (above and belov
- **Create resilient farms and ranches**

Thanks to all those Farmers and Ranchers #StillFarming!