Certified Organic Practice as a Natural Climate Solution for Soil Health and Climate Resiliency at Garnetts Red Prairie Farm

Presentation by Pryor Garnett before the Oregon Senate Natural Resources Committee on May 24, 2023

"Good morning Mr. Chair, Senators, committee staff, and members of the public. Thank you for the invitation to be here this morning. My name is Pryor Garnett.

Garnetts Red Prairie Farm is 92 acres set in the lower foothills of the Coast Range in the Red Prairie near the town of Sheridan — 90 minutes from downtown Portland and half an hour from here in Salem. The soils there are not the beautiful, deep soils of this part of the Willamette Valley - they're thin, clayey and don't hold much water. Our neighbors grow grass seed, Christmas trees and hay, mostly.

We grow certified organic grains like wheat, barley, rye and triticale, and flax and other crops for food, for fiber, for seed and for animal feed. We farm 62 acres of our own, rent another 25 acre field from our neighbor, and do contract field work on 23 acres more. All of those fields are certified organic by Oregon Tilth and by the Real Organic Project.

Real, Certified Organic

Real, certified organic agriculture is at the center of our approach to climate solutions, and I believe it should be recognized as the preeminent "natural climate solution."

Organic agriculture uses fertilizers of organic origin such as compost, manure, green manure, and bone meal, and emphasizes techniques like crop rotation and companion planting for pest control.[1] It was the only kind of agriculture before the development of chemical fertilizers and pesticides around the Second World War. Organic systems build and regenerate soil health through reduced tillage, rotational grazing, crop rotations and cover crops. These practices result in increased soil organic matter, soil stability, carbon sequestration, and water holding capacity. [2]

"Certified organic" means that a third-party has investigated an operation and is willing to certify that it is, in fact, following the rules for calling itself organic. The US Department of Agriculture provides federal regulations that define what organic means, and supervises organizations like Oregon Tilth which inspect, monitor and certify organic producers.

"Real organic" means that crops are certified organic and are grown in soil - not in hydroponic nutrient baths or in plastic containers set outside and fed from drip irrigation systems without any roots in the ground - and livestock have substantial, effective access to pastures. The Real Organic Project inspects and certifies compliance with its requirements.

By not using synthetic nitrogen fertilizers, organic growers eliminate two sources of greenhouse gas emissions - first from the production of the fertilizer, and second from the emission of nitrous oxide (N_2O) after the fertilizer is applied. And certified organic dairies and livestock operations which pasture their animals and land-apply the manure don't have the huge, anaerobic manure lagoons giving off methane and ammonia. [2]

Carbon Sequestration Through Organic Practice

Carbon sequestration in soil is often higher under organic practice. Practices like cover cropping minimize the exposure of bare soils to the elements, thereby increasing soil water retention and carbon holding capacity. One study found that organic systems have the potential for 44% more stable sequestered carbon than conventional systems.[2] Carbon sequestration can be played by sleight-of-hand, claiming credit for a ton's sequestration without acknowledging the two tons used in the process, and I'm pleased that SB 530 focuses on "net carbon sequestration," to take into account that kind of false arithmetic.

Our farm's goal is to produce only as much as the land and soil can sustainably create without depending on imported nutrients. Because we don't import nutrients, we can't afford to export them unsustainably. So we incorporate back into the soil all of the residue after harvesting a grain crop - chopping the straw and chaff and leaving it to decompose and nourish the soil microorganisms that will in turn nourish subsequent years' crops. Incorporating residue is the big, first step in carbon sequestration in our soil, because that straw is mostly carbon, and we're putting it back into the soil. Over time, that residue decomposes and turns into more stable, sequestered carbon. And we also grow cover crops, which are crops intended just to nourish the soil rather than to produce cash revenue, and when those are turned in to the soil even more carbon is started along the path toward sequestration.

But carbon sequestration isn't just about turning organic matter in to the soil. It's also about maintaining a healthy, diverse soil environment of microbes, fungi, worms, beetles, etc., that can more efficiently and rapidly convert and stabilize organic matter into sequestered carbon. We foster that biodiversity through crop rotations (cycling through different crops and practices over multiple years before growing the same crop again), and by not poisoning them with pesticides.

Soil Health for Climate Resilience

Soil health is at the heart of our climate resilience strategy, and certified organic farming is our way to increase soil health.

Healthy soil is soil that produces with fewer inputs of chemicals or energy.

I've already described how retained residues and cover crops build soil organic matter that decomposes to provide nutrients for future years' crops. That same soil organic matter also helps retain more water in the soil instead of letting it just run off. That retained water can infiltrate and recharge groundwater aquifers, and can sustain plant growth through our long, hot, dry Mediterranean summers. One climate prediction for Oregon is that our dry season will start earlier and last longer, making it even more critical that our soils be able to retain all the water they can.

A second effect of increasing soils' water retention capacity is to reduce soil erosion and loss caused by runoff. This is especially important in our rainy season, because as we get more and more atmospheric river events, our soils will wash away and head for the ocean if they can't resist erosion. Increasing soil organic matter, and cover cropping over the winter months, do this, and are both important elements of organic farming. Going beyond soil health for a moment, rotating our crops and not depending on a single crop for survival help us be more resilient against both weather events and larger economic events.

This year may be extreme, but right now we're growing: 5 varieties of wheat; 4 varieties of buckwheat; barley; rye; spelt; triticale; flax for fiber and for seed; and a vetch-rye cover crop field mix.

In short, resiliency for our farm means few inputs, short supply chains and self-sufficiency - all of which depend on soil health.

Protect Oregon's Best Farmland

We're incredibly fortunate to live in a place that's predicted to suffer fewer climate-related catastrophes than many other parts of the United States. We see more and more people moving here to live and work. That's already pressuring the protections we have for Oregon's working lands - especially in the suburbs around our cities, but also in rural areas. We just saw that pressure this session, with Senate Bill 4 to allow siting of a big semiconductor project in the Tualatin valley. Those working lands just outside the urban growth boundaries contain some of our best farmland. As California and Arizona heat up and dry up, and agriculture there becomes less and less viable, we'll need our local, productive working lands more and more. Without strong protection for those farmlands, and incentives for people to work them to produce food and fiber, Oregonians will depend on lengthy - and fragile - supply chains. That fragility is the very opposite of resilience, and that fragility is being driven by climate change. Land use protections for productive farmland, and incentives for their sustainable use for food and fiber, are essential to resilience in a future of climate-driven disruptions. Let's help Oregon feed Oregonians from Oregon's own working lands.

Thank you.

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Sources

[1] Organic Farming, Wikipedia

[2] Organic Agriculture & Organic Product Market Analysis In the State of Oregon, 2023, Prepared For: Oregon Business Development Department in response to 2022 House Bill 5202 – Section 296