

Multi-year soil health studies kicking off to guide Boulder County farmers, urban gardeners



Lewis Geyer / Staff Photographer

Black Cat Farm's Eric Skokan, right, talks with his livestock manager Andie Young in his sheep pasture near Jay Road and 55th Street on Monday. Skokan is participating in study investigating best practices to enhance soil health, and thus its productivity and contributions to food crop nutrition.

By [Sam Lounsberry](mailto:slounsberry@prairiemountainmedia.com) | slounsberry@prairiemountainmedia.com | Longmont Times-Call

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Learn more about the urban soil health study and apply to participate at www.ecocycle.org/take-action/community-carbon-farming.

Black Cat Farm owner Eric Skokan is pretty sure his practice of allowing pasture animals such as lambs to live on his northeast Boulder fields that will eventually host vegetable crops is building his soil's health.

But he's not absolutely positive, and he is hopeful he can pick up a tactic or two that could serve as secret ingredients for expediting improvements of his soil's ability to grow healthy food.

Skokan likely will get that affirmation and extra guidance thanks to his participation — along with that of dozens of other farmers and urban gardeners in the Longmont and Boulder areas —

in one of two studies being led by in part by Boulder County, the city of Boulder and nonprofit Eco-Cycle. The analyses will inform locals of the best practices to enhance soil health, and thus its productivity and contributions to food crop nutrition.

“Our soil organic matter or soil quality has slowly been ticking up” on Black Cat Farm, Skokan said. “But it’s one thing to see it anecdotally, it’s another to have it validated across a series of years and farms. While I think I might be headed in the right direction, I don’t know if I’m in the center of the road, on the fastest path.”

Increased climate change-reversing carbon sequestration, or the capture of carbon from the air so it can return to the ground, could be an added benefit of the knowledge gained through the studies. Carbon in its gaseous form further contributes to the greenhouse effect, a driver of climate change. Using plants that breathe carbon dioxide through their lives, converting them into compost once they die and combining them with other organic matter spared from the landfill to develop soil that can better grow more carbon-reducing vegetation is part of a possible strategy officials behind the research contend could be key in the climate change battle.

The 10-year soil health study focusing on Northern Colorado agricultural techniques is being spearheaded by Elizabeth Black, a north Boulder Christmas tree farmer and resident who is organizing the effort known as the Citizen Science Soil Health Project, which is funded by several sources. She will help local farmers, ranchers, turf and park managers, foresters and grassland managers track soil data points over the next decade and increase their respective land’s vitality.

“I am very concerned about climate change, and have been promoting soil carbon sequestration as a mitigating strategy for several years,” Black said. “As I have learned more about Front Range agriculture and soils, I have decided that my best strategy is to give tools to land stewards, so they can figure out how they can get their soil in the best shape possible. That way, their soil can withstand the droughts and floods ahead, and it can help draw down atmospheric carbon dioxide.”

Participants in her study will be given free annual soil tests that normally cost more than \$100 per year, and will help design the project’s final report. The study has received annual funding commitments from Boulder County Parks and Open Space, the Boulder County Sustainability Office, Longmont Soil Conservation District, the Colorado Carbon Fund, the Boulder Open Space Conservancy, Boulder Parks and Open Space Foundation, Boulder County Farmers Market and several anonymous private donors, along with grant funding from the U.S. Department of Agriculture’s Western Sustainable Agriculture Research & Education program and Boulder Open Space and Mountain Parks.

“We’re not scientists,” Skokan said. “Holding a research project together is not our bailiwick. (Black) is a force of nature. She is one of the most important people to our local foodshed. What she is doing is so critically important not just for what we’re doing right now, but for the next several generations of people.”

Black has received promises from nearly three dozen growers to participate in the soil health measurement study, including 27 in Boulder County, four in Weld County and two in Larimer County. So far, 17 organic growers and 10 conventional farmers are participating. Black said she is hoping to sign up some more larger-scale conventional farmers for the last few roster spots available for the project.

“We’re going to track tillage intensity, or how much you disturb the soil, and how many days of living cover they have on their soil, what kind of inputs of organic matter there are — compost, manure, mulch — and see what kind of correlations we can find,” Black said.

Two golf courses — Saddleback Ridge in Firestone and Boulder’s Flatirons Golf Course — also are having the health of the soil beneath their grassy lands gauged as part of the study, Black said, which she noted could help inform property owners about the best treatments for their own lawns and yards.

Residents who lack farm-sized areas but are interested in bolstering the growing capability of dirt plots around their homes also can participate in a second, three-year study that will examine the most effective carbon sequestration and soil care methods for urban areas. It is being led by Eco-Cycle with \$10,000 in funding from the city of Boulder.

That probe is seeking 250 participants. About 200 have signed up, and Eco-Cycle is seeking about 80 more to have some cushion in case some participants move unexpectedly during the project. Study participants can live anywhere in Boulder or Broomfield counties and need to dedicate a 20-by-10-foot area of their yard to the research.

“If we are to be successful in the fight against climate change, we must go beyond reducing emissions to actively removing carbon from the atmosphere,” an [Eco-Cycle webpage](#) on the study states. “Promising research ... suggests that a widespread focus on building healthy soils may be our best hope to draw down and safely store atmospheric carbon dioxide.”

The study also includes a look at the soils of 20 experienced vegetable gardeners who have already been selected to quantify not only the effects of five organic soil treatment methods, but also their respective impacts on the nutrient density of food grown in it. The methods tested will include compost, inoculated biochar, a fungi that helps plants feed themselves by extending the reach of their roots, a liquid compost tea substance and an organic mineral mix spray for leafy surfaces that helps maximize photosynthesis, according to Eco-Cycle Compost Department Director Dan Matsch.

“Obviously if we want to have a broad-scale effort it has to focus on agriculture,” Matsch said. “But ... there is a lot of non-ag land out there, a lot of populated urban and suburban land where people are already taking care of the land, and if they were to take care of it with the knowledge that this practice sequesters carbon and were part of a broad project to do that, then we could take advantage of that.”

Boulder County [also is studying the viability of compost treatments for cropland and grazing grounds in partnership with Colorado State University](#), but so far that research has shown there is

a challenging economic outlook for widespread agricultural compost applications in the county due to a lack of supply and local compost production facilities.

“If people are going to try and put in local composting facilities, people will have an uproar,” Black said. “It’s the same battle you see everywhere in Boulder County, with homelessness, with affordable housing: ‘I don’t want it next to me.’”

But lowering the monetary expense of purchasing compost for Boulder County farmers — either locally or from outside the county — could be done through a carbon credit system, in which storing the substance leads to a known, and possibly transferable, value for farmers, Matsch said. That’s why the nutrient density of the food grown as part of the Eco-Cycle study is important to measure.

“The point of this is not that everybody carries these gadgets” that measure nutrient density, Matsch said. “Rather, it’s to create a database that is large enough to say, ‘Hey, we can confirm that produce grown it this way or by this farm is 10 percent more nutritious than the average.’ Then the shopper can choose to pay more for that carrot. The exciting thing about this is in order to create mass change in agriculture, meaning farmers sequestering carbon, we have to figure out a way to create a new value for those farmers doing it.”