



SAN MATEO
RESOURCE
CONSERVATION
DISTRICT

Compost on Rangelands

Building Soil Health, Increasing
Forage, and Sequestering Carbon
Through Compost Application on
Rangelands in San Mateo County

September 2020

About 10 years ago when Marin ranchers partnered with scientists, the Marin Resource Conservation District, Natural Resource Conservation Service, and others to study what would happen if you spread a very thin layer of compost on rangelands, they found that a one-time application of a $\frac{1}{4}$ - $\frac{1}{2}$ inch of compost has multiple benefits.



Photo Credit: Marin Carbon Project

Read more:

MARIN CARBON PROJECT

Benefits of Compost

The addition of decomposed organic matter (compost) to the soil:

- improves forage production
- increases soil's ability to absorb and store water
- draws carbon from the atmosphere and stores it in the soil (carbon sequestration)



Ranchers and scientists are continuing to see benefits 10-15 years after the compost application!

Adding compost improves both the carbon and water cycles

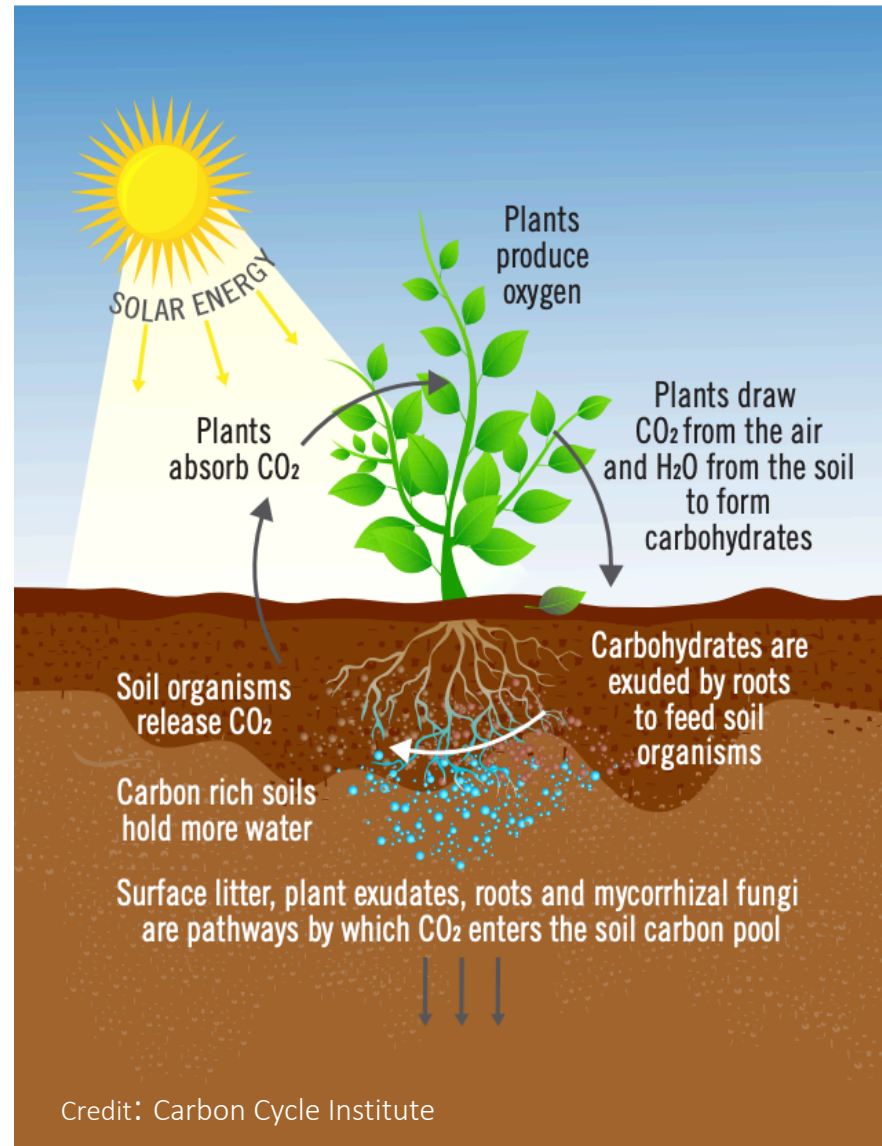
The compost adds nutrients and organic matter which improves soil health and boosts plant productivity with a potential 40-70% increase in forage production



The organic matter and enhanced root networks of the plants increase the soil's ability to hold on to water, and the ability for water to infiltrate into the soil.



The increase in vegetation leads to more photosynthesis, which means that plants are more productive at removing carbon dioxide from the atmosphere and putting it in the soil.



Increasing soil organic matter by 1% can lead to an additional ~20,000 gallons of soil water holding capacity per acre, building resilience to drought

Ranchers as Part of the Climate Solution

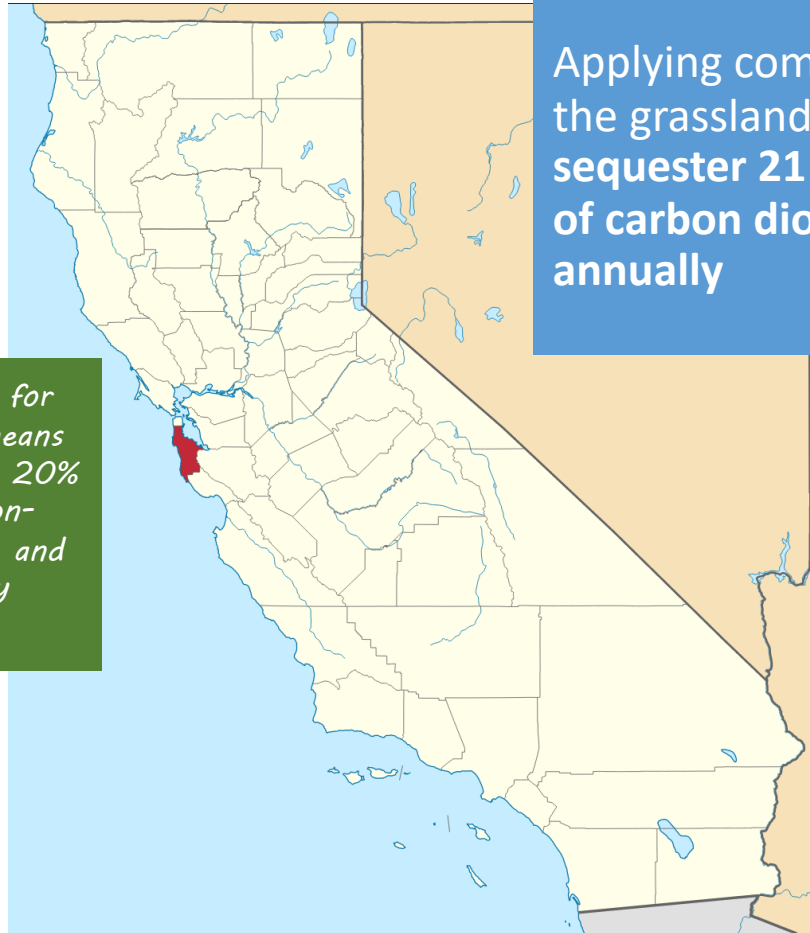
The Marin Carbon Project found that a one-time application of compost sequesters 1.49 metric tons of carbon dioxide equivalents per acre per year.

A Carbon Cycle Institute model found that San Mateo County ranchers have the potential to **sequester 17,765 metric tons of carbon dioxide equivalents annually** if compost was applied to all rangelands suited for this practice

Equivalent to the electricity used to power 3,008 homes for one year



Lands suitable for this practice means grasslands under 20% slope with non-serpentine soils and accessible by equipment.



Applying compost to just half of the grasslands in CA could **sequester 21 million metric tons of carbon dioxide equivalents annually**

Equivalent to removing ~25% of cars (4,536,915) from the road in one year



This practice is now being used by many ranchers across the state

Benefits for Your Ranch

Reduce erosion

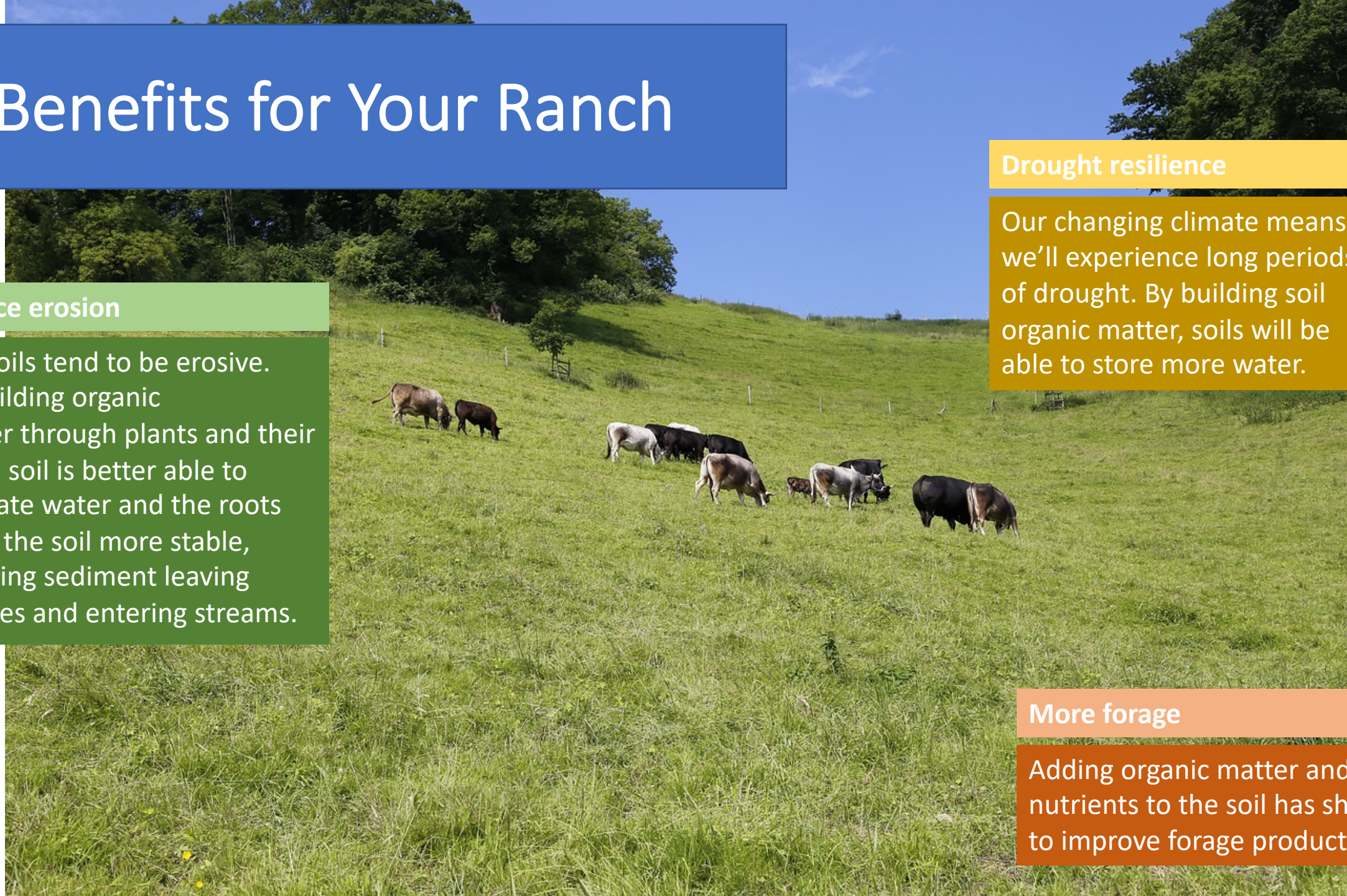
Our soils tend to be erosive. By building organic matter through plants and their roots, soil is better able to infiltrate water and the roots make the soil more stable, reducing sediment leaving ranches and entering streams.

Drought resilience

Our changing climate means we'll experience long periods of drought. By building soil organic matter, soils will be able to store more water.

More forage

Adding organic matter and nutrients to the soil has shown to improve forage production.



Cloverdale Ranch Compost Trial

While this practice has also been implemented elsewhere in San Mateo County, the RCD wanted to conduct a trial to document how to plan, implement, and monitor this practice.

In the fall of 2020, before the first rains, SMRCD contracted with Central Coast Compost to spread ¼" of compost on four acres of rangeland grazed by Markegard Grass-fed cattle on land owned by the Peninsula Open Space Trust. A total of 135 cubic yards of compost was spread.

SMRCD conducted pre-compost soil samples and vegetation surveys and will monitor soil and vegetation for three years after the compost application.

Stay tuned for results!



Funders & Partners



Project Logistics

A blue commercial spreader is shown from a side-rear perspective, spreading a dark, moist material (compost) onto a field of dry, yellowish-brown grass. The spreader's hopper is on the left, and the spreading mechanism is on the right. In the background, there is a line of green trees under a clear sky.

Compost for our trial was \$64 per ton including delivery and spreading

Carbon to nitrogen ratio of the compost was 11.7 to 1

You may want to hire a commercial spreader if you are applying to larger areas (more than 5-10 acres).

Some compost producers/suppliers have spreading equipment and can include that in your total cost. It makes it easier logistically if you can hire one company or person for the compost, delivery and spreading.

Before you start

Compost type: Use compost with a high carbon to nitrogen ratio. Its advisable to use high quality agricultural compost.

Application: $\frac{1}{4}$ - $\frac{1}{2}$ inch, or about 35 - 70 cubic yards per acre, every 10-20 years on lands under a 20% slope, and non-serpentine soils. Apply compost without incorporating, before the first rains. It should be like a light dusting on the surface of the land.

Buffers near waterways: Allow a buffer of at least 30 feet from waterways when applying compost. This will depend on the slope and vegetation near waterways



Tip! If you're monitoring soil, use the same soil sampling protocol and lab to maintain consistency

Consider! What was the forage like before application? Take note so you can observe changes if they occur

The RCD can help!

- ❖ We can design the practice for you by finding a suitable location that meets all the best management practices
- ❖ We can help with soil monitoring
- ❖ We can connect you with information about compost producers, compost types, cost, C:N ratio, feedstock and whether the compost supplier also hauls and spreads compost
- ❖ We can help you access funding from federal, state, and other programs

Financial Assistance

- ❖ Rangeland compost application is now an approved practice of the Natural Resources Conservation Service. You can receive cost-share for this practice through the Environmental Quality Incentives Program. Contact the NRCS for assistance (Contact Jim Howard at 650.726.4660).
- ❖ CDFA's Healthy Soils Program is a competitive grant program available for agricultural producers. The RCD can help you apply.

Contact Kasey Butler if you have any questions or are interested in applying compost to your rangeland.

kasey@sanmateoRCD.org or 650 712-7765 x108

