

## Soil Health and Soil Carbon

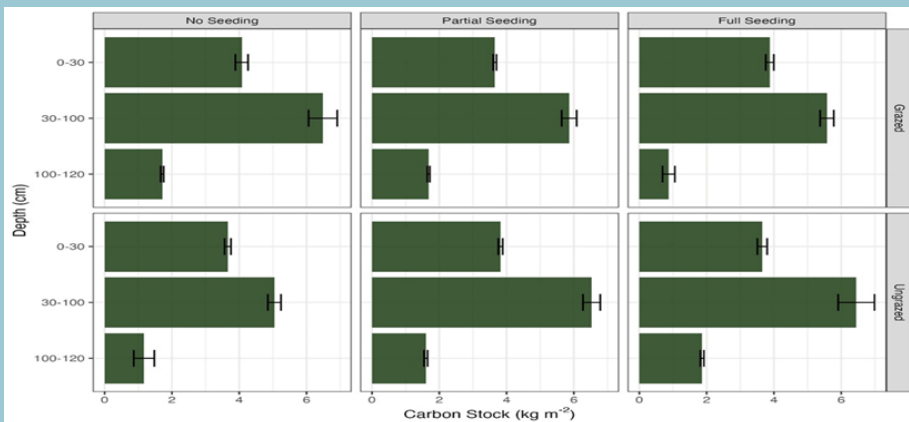
### Rangeland Seeding

- Studies show seeding can increase root mass in soil and as a result, increase soil organic carbon
- Increased plant roots can improve soil organic matter, soil water holding capacity, and nutrient absorption

### Compost Application

- Short-term increase in soil organic carbon
- Long-term studies are needed to understand impact over time

Soils change slowly and soil health benefits may not be evident within the two-year time frame of many research studies.



Ryals et al, 2016

## Effects of Compost Application and Seeding on Soil Health and Forage Production and Quality

Fadzayi Mashiri and Julie Finzel  
UC Cooperative Extension  
Livestock and Natural Resources Advisors

*Using compost application and rangeland seeding to improve soil health attributes and species diversity on rangelands is a topic of interest for many rangeland managers. Rangeland seeding can improve ecosystem health and plant productivity. Compost application is emerging as a tool to enhance soil health, boost plant productivity, and support ecosystem resilience.*

*This brochure provides a brief overview of the current research and findings related to compost application and seeding on rangelands for soil health objectives.*

Fadzayi Mashiri—[fmashiri@ucanr.edu](mailto:fmashiri@ucanr.edu)  
Julie Finzel—[jafinzel@ucanr.edu](mailto:jafinzel@ucanr.edu)

# Benefits of Rangeland Seeding and Compost Application

## Rangeland Seeding Benefits

- Increase species diversity
- Extend growing season
- Increase forage production and quality
- Improve pollinator habitat
- Increase soil organic matter



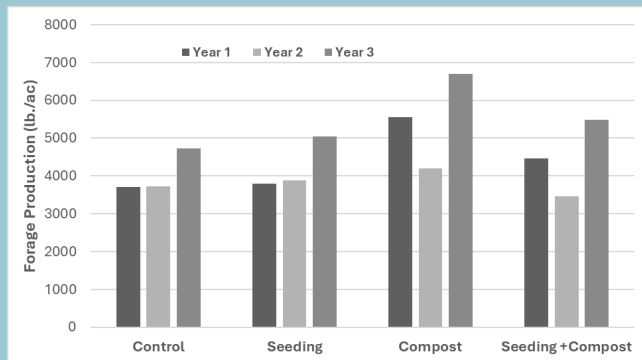
Credit: Billy Freeman

A rangeland drill in action

## Effects of Compost Application

- Increased forage production and quality
- Better forage utilization
- Short-term increase in soil organic carbon
- No significant increase in species diversity
- Slight decrease in forbs

One three-year study found that seeding and compost application tend to increase forage production and quality. Results from this study are presented below and underscore variability over time as a result of precipitation patterns.



Credit: Scott Oneto and Toby O'Geen

## Considerations for Seeding and Composting

- Results tend to vary regionally due to soil, topography, and climate variability.
- Differences in weather patterns from year to year impact results
- Seeding benefits include reduced erosion on degraded sites, reduced weeds, and increased perennial species.
- Considerations for species selection:
  - ♦ Grasses (annuals/perennials)
  - ♦ Legumes (nitrogen fixing plants)
  - ♦ Cool season vs. warm season plants
  - ♦ Tap roots vs fibrous roots
- Avoid compost applications on steep slopes, in wetlands, and riparian areas.



Credit: Billy Freeman

Applying compost on rangelands