

Soil Health Principles For Grazing Lands

1 Minimize disturbance

Soil microbes are critical to soil function and plant health. Their jobs include decomposing organic material and making soil nutrients available to plants. Tilling the soil destroys soil microbes. If you're a grazer who doesn't raise crops, tillage may not be a problem, but there are other things you can do to minimize disturbance.

Manage your grazing to avoid compaction using these tips from Mark Kopecky, state agronomist in New Mexico for the U.S. Department of Agriculture's Natural Resources Conservation Service:

- Keep mechanical and hoof traffic off wet soils as much as possible.
- Maintain pasture swards with lots of vegetative density and leave enough residual vegetation at the end of each grazing event to help cushion the soil surface.
- Use short grazing periods and allow pastures to regrow to the proper stage before you re-graze a paddock.
- Monitor your soil fertility to keep plants growing as vigorously as possible. Good plant growth, earthworm activity and other soil biological processes can restore good soil structure over time.
- Remember that plants are better than steel at reducing compaction. When comparing long-rooted cover crops and subsoilers, The Ohio State University research found that plants created more pore space, collected more water, and yielded more bushels of corn per acre.



2 Keep the soil covered

Plants – whether as cover or residue – protect the soil, keeping it cool in summer and warm in winter. Cover also provides soil microbes with the food they need to do their jobs, whether through root exudates plants trade with them for nutrients, or from surface plant residue that microbes break down and eat. Cover also prevents invasive weedy species.

Graziers want to keep the soil covered to manage both residual and residue. Though the two terms sound similar, they provide very different services for pasture health. Residual is the living plant material left behind after a grazing event, while residue is the dead plant material left on the soil surface.



Soil Health Principles For Grazing Lands (cont.)

3 Keep live roots in the soil

Through photosynthesis, plants create carbon-based sugars. A sizable portion of these sugars are transferred into the soil via the plant's roots where it feeds the 1 to 2 tons of microbes living in the soil. In return, as they process the carbon found in the soil, the microbes help make needed nutrients available to the plant, growing healthy roots, which help reduce compaction. This improves soil structure, creating better growing conditions for plants. In order to maintain healthy roots, leave grazed plants with adequate leaf area and give them enough time to recover after being grazed.

4 Promote diversity

Diversity is one of the most important services pastures provide because it increases long-term carbon sequestration, provides wildlife habitat, increases resilience in drought and improves animal productivity.

To better manage diversity, don't graze the same place at the same time every year. (Check out how these ranchers successfully adjusted their grazing to increase warm-season grasses in their pastures.) Use your livestock to increase diversity by basing management on the growth of our pasture forages – not a calendar date. In many cases, changing your grazing management from year-round use to rotating through pastures can also increase diversity. You can also add to diversity by seeding. Here are some ideas for approaching pasture improvement with seeding and pasture mixes.

5 Integrate livestock

Plants, soils and animals evolved together, and all are essential to a properly functioning ecosystem. Livestock convert high-carbon material to low-carbon material that feeds the soil food web. Manure provides a home and food for beneficial insects that help cycle nutrients and can reduce pest issues. A rancher's goal is to improve soil health through good grazing. That means growing more grass and using livestock to convert it into nutrients that feed microbes.

