



One Year of Regenerative Grazing

How a single grazing season can benefit soil and ecosystem health

Rotational grazing is offered as a solution to improve the health of soil and ecosystems, but converting land into pasture might seem like an uncertain venture. Many of the ecological benefits of grazing take several years to become apparent, and during that time, it can be hard to trust that grazing methods are having the intended impact. How much change can be measured after just one year?

Parmelee Farm, Randolph, Vermont

In early 2024, as Clark Parmelee prepared to expand his cow-calf operation, he leased 34 nearby acres to use for rotational grazing. These 34 acres have not been grazed in recent years. Their primary soil type is a Buckland Loam that is typical of Vermont's Central and North Central highland pastures.

NGBI conducted in-field assessments and lab testing in May 2024, prior to grazing. We repeated the assessments in May 2025 under similar weather and management conditions.

The results show that **the pasture made clear biological gains at the soil surface**. The trajectory is positive, and continued management will be necessary to translate surface improvements into deeper, more resilient soil function.

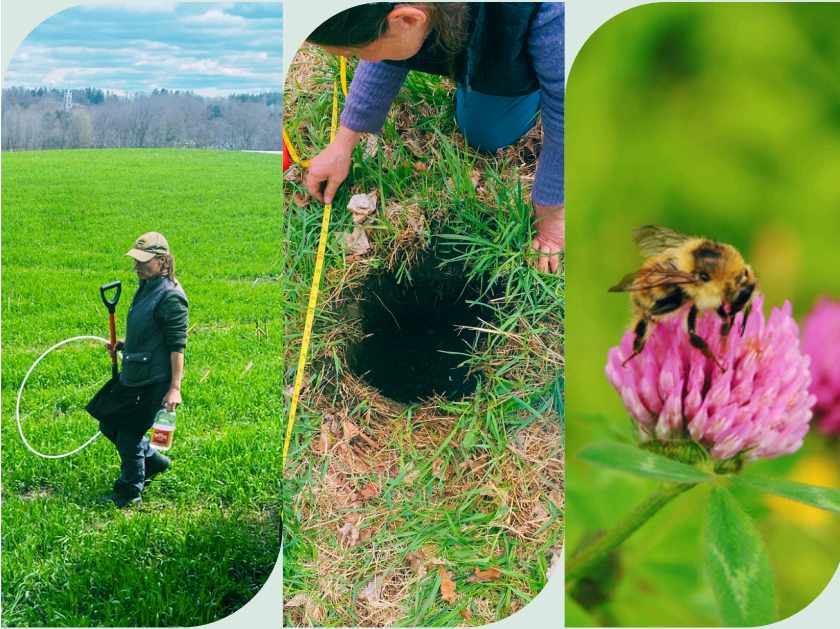


Meet Clark

Clark Parmelee grew up in Randolph, Vermont, on the family farm that he now runs. Parmelee Farm is a cattle and hay operation on 38 grazing acres and a herd of 8 cows, 8 calves, and 9 yearlings managed using rotational grazing. Hoping to expand the herd, Clark partnered with neighboring landowners to convert 34 acres of nearby land to grazing pasture.



The Difference a Year Can Make



The pasture saw increased plant diversity, earthworm and insect populations, and water infiltration. Beneficial plants like red clover and dandelion became more prevalent. Earthworms per cubic foot increased by 150–250% and earthworm castings became abundant. Counts of other insect species increased. The rate of water infiltration reached 4–5 inches per hour.

What does this mean for the pasture?

Increased plant diversity suggests early positive biological response to cattle grazing. Earthworm and insect populations are key indicators of biological soil function, and these increases suggest better nutrient cycling, residue incorporation, and habitat conditions. Improved water infiltration helps plant growth and reduces the risks of runoff and erosion.

What's next for this pasture ecosystem?

Despite good bacterial populations, levels of microbial diversity and helpful fungi are still very low. Improvements to soil microbiology will help release plant-available nutrients and improve ecosystem function.

Soil density is acceptable at the surface, but is severely compacted below. About 80% of roots terminate at 4–5 inches. Aggregate stability remains at about 50%. Compacted soils limit root depth, air, water movement, and microbial activity, and pose runoff and erosion risks during heavy rainfall.

Soil Organic Matter remained around 2.2–2.4%, and should increase as the microbiology, structure, and compaction of the soil improves.

The first year of grazing set in motion key ecosystem changes. Under Clark's continued well-managed grazing, ecosystem benefits to the pasture will expand and compound.

