Soil Biology: Is It the Missing Link in Pasture Production? Evaluating the Effects of Biological and Chemical Amendments on Soil Biology and Pasture Biomass Production

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Pasture soil health and productivity is decreasing worldwide, increasing the challenges of primary production for graziers. Most notably, soil microbial activity directly impacts soil fertility; and declining soil heath adversely affects human health. Using a variety of soil amendments, we tested our hypothesis that applying living microbes, and plant nutrients(chemical fertilizers), optimizes soil health and pasture production. Before applying amendments, we sampled the soil and received advice from an agronomist regarding which fertilizers to apply. We also tested the soil for microbial activity. Experimenting with six trial plots, we applied various biological and chemical products in isolation and in combination, including plant nutrients; biological amendments as compost extract, a product containing soil microbes; and a microbe food and stimulant. Twice during the investigation, we measured pasture production by cutting, drying, and weighing the plants from each plot. At the end of the investigation we repeated the soil biology testing which showed that plant nutrients alone resembled the control, but that the microbe food and stimulant had significant ecological and financial benefits. Compost extract showed similar advantages, but cost more. The response of both products weakened when combined with plant nutrients. Although plant nutrients and compost extract with plant nutrients increased biomass production, compost extract and the microbe food and stimulant proved superior in stabilizing biomass production over time. These biological amendments are ecologically beneficial and a cost-effective alternative to chemical fertilizers. They carry the potential to revolutionize the health and productivity of soils, and improve human health for future generations.