



How Forage Management Can Relate to Regenerative Grazing and Soil Quality

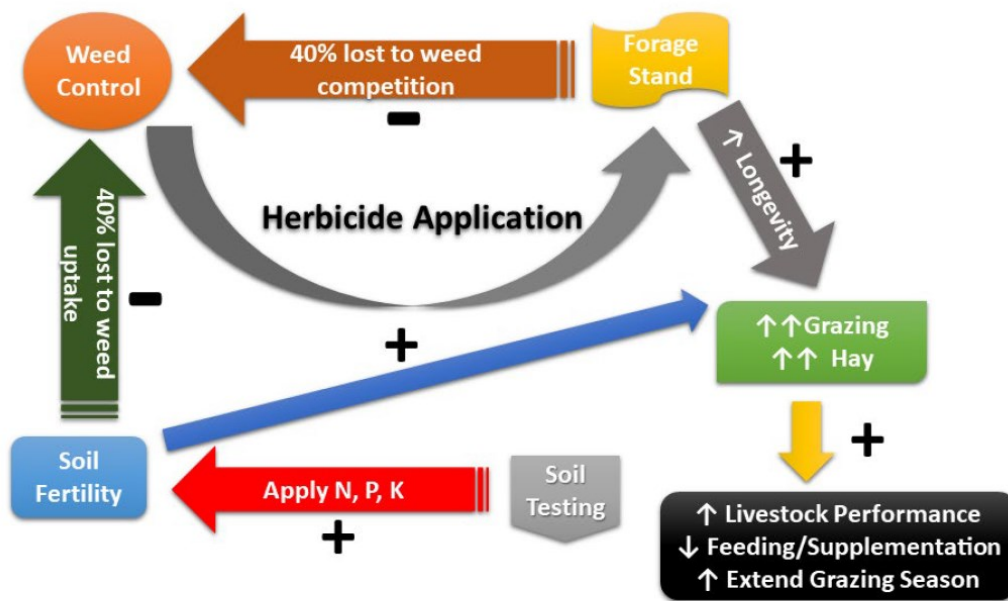
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Regenerative grazing and soil health (soil quality) are hot topics but are not new ideas nor is the idea of managing livestock on grazing systems. The same concepts and goals can be achieved if producers become better managers and concentrate on developing practices that are proactive instead of reactive. There is a lot involved in managing soil health and pasture fertility holistically. Soil biological processes are complex and they interrelate with the microbial species, soil moisture, temperature, soil structure, organic matter, forage species, and livestock classes. One aspect of the holistic approach usually left out when transitioning from a chemical to a regenerative biological system is the slow process that makes it impossible to build high organic matter in one or couple of years. It is important to recognize that it will take several years for soils to turn around depending on many complex factors. When developing an action plan several key pieces need to be considered in the southern USA.



1. **Assess your forage resources** – This is an important part of livestock sustainability because having a diverse forage resource system that includes cool- and warm-season forage crops (grasses, legumes, and forbs) allows for extending the grazing season and reduces the need for hay production. Limiting hay utilization reduces the export of nutrients off the farm or to another location on your farm. There is a need to determine strategies that can help mitigate forage needs during anticipated shortage periods by utilizing pinpoint forage species, supplementation, or reduction in stocking rates. Legumes such as perennial (white and red clover) and annual (arrowleaf, ball, crimson, berseem, balansa)

Figure 1. The four pillars of an effective forage management program.

clovers can complement pasture nutritive value, fix atmospheric nitrogen, and provide better growth distribution. The addition of cover crops also maximizes the utilization of the farm enterprise while providing soil benefits.

2. **Understand your soils and soil nutrient balance** – Although a soil test is not the only form to assess soil quality, the tool allows us to determine nutrient deficiencies and acidity that could affect forage production, especially the integration of legume species to reduce nitrogen supplementation. Due to the rising cost of fertilizer, producers cannot continue guessing what nutrients are needed and how much to apply to get a growth response. Soil quality also takes into account a combination of many factors including chemical, physical, and biological properties. Soil aggregates, pore space, mycorrhizal fungi, biological activity, organic matter, carbon, water infiltration, moisture, temperature, and cation exchange capacity are a few of the assessment tools. For more information about soil testing contact your local County Extension Office or visit <https://extension.msstate.edu/agriculture/soils/soil-testing>.
3. **Develop a grazing management strategy that fits your operation and needs** – One of the major comments that I usually hear from producers is that rotational grazing takes too much time! My question is, how

many hours per acre do you spend in the tractor cutting, raking, baling, and storing the hay? How many hours per day and how days do you spend feeding hay in the winter? When taking into consideration the economic involvement of hay production, developing efficient rotational grazing makes much more sense. The rotation intensity should depend on your goal and objectives. There is an easy way to subdivide your pastures by using a single strand of electric fence. Implementing a rotational grazing system can increase productivity and grazing efficiency from 25 to 40% depending on your management strategy. Another important aspect is that livestock behavior of animals that are getting adapted to a rotational grazing system will tell you when they are no longer getting the needed nutrition in a pasture. Rotational grazing also allows the pasture to recover and be more competitive with weeds in your pastures.

4. A well-executed rotational grazing system also allows the recycling of plant nutrients in the paddocks through the nutrient present in the fecal and urine deposits. It is estimated that about 25%, 20, and 15% of nitrogen (N), phosphorus (P), and potassium (K) contained in forages consumed by grazing cattle are retained in their bodies to support their metabolic functions. That means that the rest of these nutrients (75% N, 80% P, and 86% K) pass through the animal and are excreted in urine and feces and recycled by microbial activity in the soil, and made available to plants for uptake. To capitalize on this soil nutrient cycling process, it is important to have adequate soil organic matter (SOM) that can provide beneficial soil microbes (fungi and microbes), a more efficient nutrient delivery, reduce nutrient leaching, improve water infiltration and retention, increase cation exchange capacity, and help plants develop deeper and healthier root systems. A good pasture should have from 2 to 6% organic matter. The percentage of SOM is also associated with good soil aggregation which is closely related to soil carbon sequestration and plays an important role in the stability of the soil carbon pool.
5. **Develop a targeted weed control program** – Remember that most weeds are opportunistic that can be more prolific under poor fertility and poor grazing management strategies (overgrazing). Although weeds might be palatable to animals at a young growth stage, some of them can also be toxic. When someone tells me that their cattle are trained to eat weeds, it means that there is not enough forage to sustain their nutrient requirements. The cost of herbicides can be reduced by maintaining a good fertility program, proper pH, and good grazing management that maintains dense forage stands. It is important to scout your pasture and hay fields to determine weed species and determine a broad-spectrum herbicide that could target those weed species. The efficacy of a herbicide depends on the timely application, meaning when weeds are less than six inches tall. Scouting should be about actually walking your pastures instead of fence-driving in your truck or ATV. Keep in mind that herbicide treatments will be more successful when implemented in conjunction with improved fertility and grazing management. It is important to pay attention to planting, grazing, and haying restrictions associated with a specific herbicide. For more information related to herbicides labeled for forage production, visit the Forage Section of the Weed Control Guidelines for Mississippi at <http://extension.msstate.edu/publications/weed-control-guidelines-for-mississippi>.

Soil quality depends on plant root growth, grazing management, and forage species diversity. A grazing approach that maintains excellent soil porosity and organic matter will translate into roots reaching greater depths, extracting nutrients, and having a better persistence under environmental stress and/or grazing pressure. The integration of a regenerative and soil-quality forage production system should include how to optimize forage production relative to soil capabilities and manage the livestock to achieve the desired consumption of the forage species and distribution through the growing season. The evaluation of an effective forage management program should be measured in soil management that improves organic matter over time, improves nutrient cycling to improve forage production, and measure animal production in terms of units of animal input (pounds of beef per acre). Soil organic matter is not a single solution to increasing pasture resilience since soil type, rainfall, temperature, forage species (plant nitrogen status), grazing management (plan population dynamics), weeds, insect pests, and diseases, are also key factors. Healthy soils that have good organic matter, soil physical properties (texture and porosity), and are balanced with the needed nutrients are the basis of any productive cattle operation across the south.

Upcoming Events

Beef Cattle Field Day—March 30, 2023 | Newton, MS

Small Ruminant Workshop—April 4, 2023 | Ripley, MS

Cool-season Grazing Management Field Day—April 5, 2023 | Starkville, MS

Small Ruminant Workshop—April 12, 2023 | Hattiesburg, MS

For upcoming forage related events visit: <http://forages.pss.msstate.edu/events.html>

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