



Ecosystem Benefits of Grasslands

Grasslands play an important role in delivery of ecosystem services, which include carbon sequestration and nutrient cycling.

In Alabama, most forage systems are managed under grazing. Management practices directly influence the ability of grasslands to provide services. Following are some of the major considerations.

FORAGE ABILITY TO RECOVER FOLLOWING DEFOLIATION

Proper management can be an ally in keeping the forage stand healthy and achieving persistence. The recommended stubble height of individual forage species is based on maintaining enough leaf area postharvesting for the plants to recover and regrow without relying as heavily on root reserves for energy. Higher than recommended frequency and intensity of harvest events may compromise the ability of forage species to recover and can lead to loss of forage stand.



STAND SUSTAINABILITY AND LONGEVITY IN PERENNIAL GRASS-BASED FORAGE SYSTEMS

Management strategies can help to improve and maintain the desired plant communities and increase animal performance, while promoting nutrient cycling and soil health within grazing systems. Developing a grazing management plan requires knowing the species composition of desirable plants and understanding how those plants can meet an animal's nutrition demands. Overgrazing can lead to stand thinning, increased weed competition, and poor animal performance and should be avoided.

STOCKING RATE CAPACITY OF A FORAGE SYSTEM

Stocking rate (SR) should be adjusted based on forage mass availability. Changes in pasture composition can occur either in a mixture of forage species (i.e., grass and legume) or by invasion of weeds that are refused by animals and tend to increase in pastures over time.

Among the alternatives to deal with this issue are to associate different animal species (i.e., cattle and goats [nonselective grazers]), mow off or apply herbicide on weeds when needed, and adjust SR. Paying close attention to pasture composition can help to prevent the increase of toxic plants that can potentially cause health issues or death of animals.

NUTRIENT DISTRIBUTION, ANIMAL HEALTH, AND TREADING IN GRAZING SYSTEMS

Cattle usually return around 80 percent of the nutrients consumed back to pastures. Nutrient distribution from animal excretion is important to optimize forage accumulation and quality, especially on low-input systems.

Better nutrient distribution can be achieved by employing rotational grazing. This is because animals remain in the area for a defined period of time, thereby avoiding establishment of exclusion areas or excessive excreta deposition. Grazing management strategies can be an ally for maintaining an animal's health and may interrupt the life cycle of parasites or reduce contact of livestock to them.

Grazing strategies also impact the length of treading damage on pastures. Livestock often can cause damage to the growing points of plants, increase compaction, and reduce water infiltration on pastures. Some grasses, such as bahiagrass and bermudagrass, are more tolerant to treading than others, while some legumes are less tolerant. Damage from treading generally is higher in heavy clay soils and increases under high soil moisture, regardless of soil type.



WILDLIFE HABITAT AND POLLINATORS

Forages are a key component of the diets of grazing and browsing wildlife. They also provide space for habitat, which potentially adds value aesthetically and commercially to farming operations through opportunities for hunting leases and agritourism.

Grasslands are also an important source of habitat and food for a variety of pollinators. Recent estimates indicate a decline in the worldwide population of pollinators. This has increased efforts to use grasslands, especially legume-grass mixtures, to mitigate this issue.

GREENHOUSE GAS EMISSIONS

In recent decades, worldwide efforts by the economic sector to quantify emissions of greenhouse gases have led to discussions of the contribution by livestock-forage systems. In this context, efforts have focused on determining inputs and outputs of activities related to the livestock industry through life cycle assessments. Grasslands are able to offset a large portion of emissions by the livestock industry through capture of carbon dioxide from the atmosphere and carbon sequestration in grasslands. In addition, improved management practices in conjunction with reduced off-farm inputs helps to decrease emissions.

CARBON SEQUESTRATION

Soils under perennial grasslands are major sources of carbon storage due to limited soil disturbance over time. Through deposition and decomposition of above- and belowground plant material over time, the nutrients incorporated into the soil increase soil fertility along with chemical and physical characteristics.

For more information, see "Grazing Management Impacts on Forage Systems" on the Extension website or scan the QR code to access the publication.



Figure 77. Measuring carbon and CO² emissions.