

## Authors:

Keith D. Johnson<sup>1</sup>

<sup>1</sup> Purdue University

## Summary

*This report, addressing improved grazing practices, is one of a set of seven describing practices supported by the Grasslands Partnership project. Improved grazing management, management that allows for vigorous canopies, results in robust roots, which, in turn, are a major key to increased soil carbon, soil health, and profitability. Guidelines are provided below to ensure residual canopy heights, stocking rates, and rest allow for such vigorous pastures. Although the focus here is on rotational stocking, similar outcomes can be achieved with proper stocking, attention to canopy heights, and rest. Documentation requirements for management activities and pasture condition are also provided.*

## CLIMATE SMART PRACTICES – IMPROVED GRAZING MANAGEMENT

Improved grazing management practices will increase grass vigor, productivity and persistence. Consequently, root biomass, soil carbon storage, and soil quality will also improve. Larger root biomass in the soil and greater soil organic matter concentration, coupled with increased water infiltration, contributes to drought resiliency. Reductions in inputs associated with improved grazing practices (e.g., improved manure distribution and incorporation, reduced hay feeding) will also reduce the greenhouse gas footprint of grassland agriculture and reduce costs. Finally, healthier grass stands will also reduce requirements for pasture renovation and/or re-establishment.

## EXPECTATIONS

- Practices implemented will occur where endophyte-infected tall fescue contributes greater than 30 percent of the dry matter yield in a pasture in May.
- Forage response in a “business as usual” pasture will be compared to a *properly* stocked rotational system.
- Livestock type to be used are cow-calf, stocker calves, or small ruminants.
- Separate herds/flocks, preferably with similar livestock type, will be utilized.
- Extension Service Agents will be the first point-of-contact with the livestock producers as new practices are implemented, and data is collected.
- Soil fertility will be documented before grazing begins. Soil pH is preferred to be higher than 5.8.
- Similar winter-feeding practices is preferred for both groups unless body condition dictates otherwise. Co-mingling is accepted for ease of livestock care.
- Data collection will be done in a timely fashion.

## BACKGROUND INFORMATION

Rotational stocking is a system that divides large fields into smaller paddocks. In this system, animals are moved frequently to create higher stock density as compared to continuous stocking where the pasture is not subdivided into paddocks. A *properly* stocked rotational stocking system allows forage to recover, have adequate regrowth between grazing cycles, reduces spot grazing, provides more even manure distribution, and allows stockpiling of some paddocks for fall and early winter grazing. Rotational stocking does require careful monitoring and greater startup costs for water distribution and fencing.

## WHAT IS TO BE ACCOMPLISHED – COMPARISON OF “BUSINESS AS USUAL” and ROTATIONAL STOCKING SYSTEMS

A stocking rate for the expected yield of the pasture when grazed in a rotational stocking system and the currently used stocking system and stocking rate will be put into practice and information noted below gathered. The Extension Service Agent and producer, in conjunction with other knowledgeable resource personnel, will determine what the appropriate stocking rate will be for the rotational stocking system.

Rotation frequency will not be dictated by a strict number of days; rather, rotation to a new paddock in the rotational stocking system will occur when residual (stubble height) is at least 4 inches. Forage height at turn-in to a new paddock in the rotational stocking system should be at least 10 inches.

Stocking rate should permit stockpiling forage growth in the late summer and early fall on approximately one-fourth of the acreage being grazed in the rotational stocking system. If forage growth is less than 30 percent legumes in the paddocks being stockpiled and soil moisture is adequate, these paddocks should be considered for addition of nitrogen fertilizer (less than 50 pounds of N per acre) as appropriate for the location.

Data collected from both the “business as usual” stocking and rotational stocking systems will include:

- Stocking rate for “business as usual” and rotational stocking systems.
- When grazing begins and ends for each stocking system. A running record of number of grazing days within each paddock will be recorded. The full grazing season for both the “business as usual” stocking and rotational stocking systems will be evaluated.
- Forage height *variation* within the “business as usual” and rotational stocking systems will be periodically measured. Height measurements (in inches) will be done for both stocking systems just prior to when livestock rotate from-and-to a new paddock in the rotational stocking system.
- Inventory of plant species will be measured on the day of turnout in both grazing systems and again in mid-July. The step-point method will be used with a minimum of 30 evaluation locations in each stocking system. The same paddock year-to-year in the rotational stocking system, will be sampled. A visual estimate of percent dry matter contribution from each plant species will be recorded.
- Amount of stored feed (hay, silage, baleage) and supplements provided during the grazing season, if drought occurs, and after the grazing season will be noted for each stocking practice.
- Pictures will be taken throughout the project to support data and shared in a Grasslands Partnership central file.

- The above data will be recorded in a Grasslands Partnership spreadsheet template that will be provided by the Extension Service Agent who will work in collaboration with the producer to collect data.

In addition, some producers and Extension Agents may elect to collect supplemental data. The items below will not be required, but they would provide further information that support the results from the required data set.

- With use of a rising plate meter, an estimate of dry matter yield will be measured in conjunction with height measurements mentioned above. A minimum of twenty-five random locations within the pasture or paddock will be evaluated on each date.
- Observations such as soil moisture content (dry, adequate, wet), temperature, nutrient deficiencies and insect concerns will be noted at weekly interval during the grazing season.
- At the beginning and end of the project, a minimum of six soil sample cores to a depth of three feet will be taken in each stocking system. Depth of root penetration will be noted. Soil will then be washed away from the roots to see if differences in mass are found.