Developing a Regenerative Grazing Plan

Quick-Start Guide

This Grazing Plan Quick-Start Guide is not intended to be a full manual on the management of grazing in general, which of course includes considerations related to forage growth physiology, fence and water infrastructure, animal management, and a host of other topics. For more on these topics, refer to MU Extension publication M157 - *Missouri Grazing Manual* and consider attending a Missouri Grazing School organized collaboratively by University of Missouri Extension, USDA-NRCS, and the Missouri Forage and Grassland Council.

The Grazing Plan Quick-Start Guide provides a basic step-by-step guide on the development of a regenerative grazing plan, specifically one that makes use of a grazing chart both for the initial planning and for adaptive management throughout the year.

Most experienced livestock producers have a good grazing plan in their heads. They know their farm better than anyone – where their most productive pastures are, how their animals best move through the pastures, when their frost dates are and how to graze accordingly in the moment. But as with any successful business, things can get overlooked when we don't take the time to establish baselines and track progress as we go. It's nothing new to state that grazing is complex – it requires managing around unpredictability, like weather, and managing variability, like incredible diversity in soil and forage types. Grazing planning can help us better understand exactly what we are managing and when, so that we make better informed, long-term decisions. Imagine if you could precisely predict when you will run out of forage during drought, allowing you to destock some of your livestock well ahead of the rest of the market. Imagine easily tracking forage trends in each pasture month by month and year over year, and how that information could save you money on seed, fertilizer, and other inputs.

Regenerative grazing management is less about strictly adhering to a set of prescribed grazing practices and instead is more about outcomes – managing for outcomes like improving soil health, increasing forage biodiversity, enhancing animal performance, etc. First and foremost, we must define the desired goals of our grazing management.

Step 1. Identify the goals associated with your grazing management.

- Make goals specific to the context of your operation. Write them down and refer back to your goals with every management decision you make, asking yourself if this decision moves you closer to the desired outcomes.
- Common regenerative goals for a grazing operation might look like increasing organic matter and sequestering more carbon, or increasing biodiversity of plant and animal species. Do you want to improve your operation's profitability by a specific amount? There are no right or wrong answers. **The important thing is to write them down, be specific, and make specific plans on how to get there.** And of course, actively monitor your progress and replan as necessary.

Step 2. Create a pasture inventory.

- *List pastures one per row in the "Pasture Name" column on the left side of the grazing chart.* Also include fields used in crop production if animals are ever grazing crop residues or cover crops. For operations using portable, temporary fencing (e.g., poly wire), it is not necessary to try to list temporary subdivisions or strips made as though these areas are separate pastures.

Create a corresponding map of pastures, denoting water points, fences, and other features.

- Use your existing FSA maps or other available mapping options – some good resources for both mapping and grazing planning include MaiaGrazing, PastureMap and AgriWebb, or Google Earth and University of Missouri CARES Map Room for pasture map drawing.
- *Record the grazeable acres of each pasture in the "Acres" column on the left side of the grazing chart.*

Define the forage species composition of pastures, noting any season-of-use limitations.

- We suggest indicating the primary forage growth pattern of the pasture—for example, "cool-season" or "warm-season." If pastures are a mix of the two, perhaps estimate the mix and indicate that—for example, "50% cool-season, 50% warm-season." **This information should help inform many aspects of your grazing across the season, including ideal recovery periods, recommended residue heights for specific pasture species and seasonal growth curves, among other critical metrics.** For more details on these important topics, please refer to the Missouri Grazing Manual. *Recording these details in the "Comp" column will help you plan your grazing rotations – you may find it helpful to organize/group pastures based on forage composition on your chart.*

Estimate forage availability in each pasture.

- Specific techniques for estimating forage availability in a pasture can include measuring the canopy height using a "grazing stick," clipping and weighing forage within a quadrat, or even simply experienced visual observation by walking off an area of what you estimate a cow/animal unit to consume in one grazing day. Often, large pastures will have highly productive portions and lowly productive portions—what proportion of the acreage is made up of which type? Estimating the yield potential for each portion and then adding the total together can create a more realistic assessment. One additional online resource available for estimating forage yield is the Grazing Wedge from the University of Missouri Extension. *You'll need to take these estimates, along with your understanding of your seasonal forage growth curves, and calculate a total annual forage yield per acre for each pasture.*

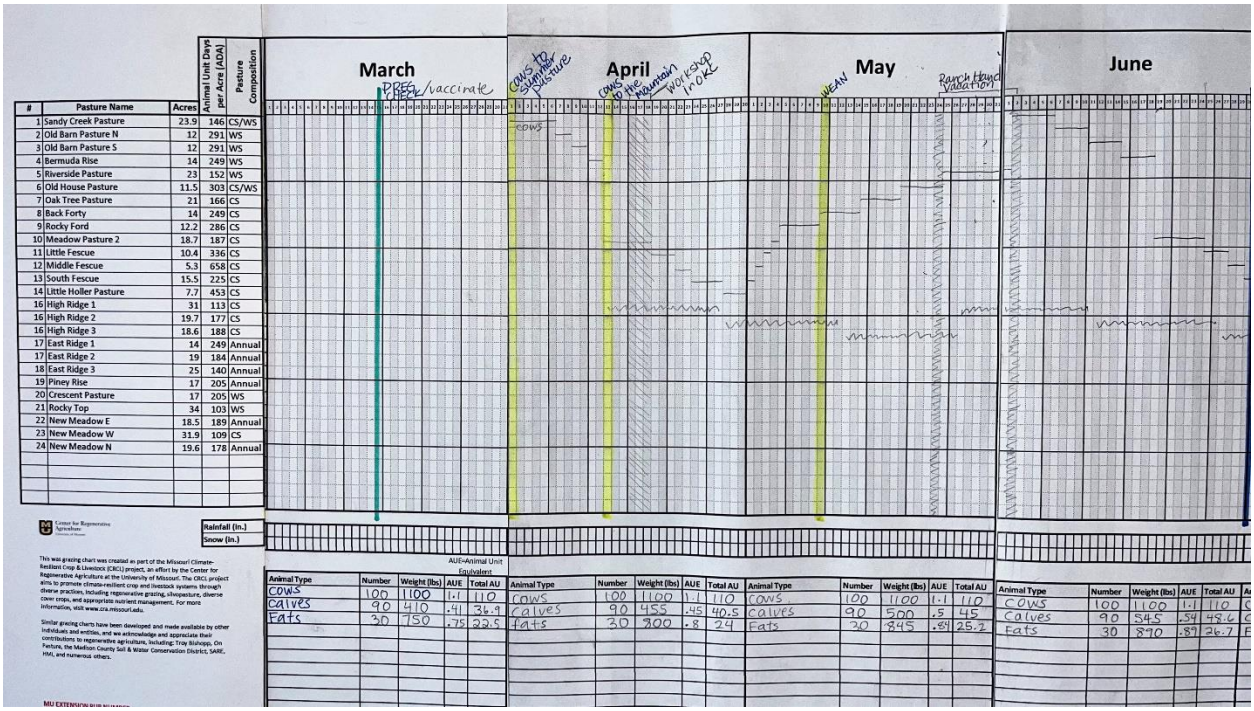
Determine the optimal range of recovery periods for each pasture after a grazing event.

- Providing an excessively short recovery period to a pasture can have negative impacts, but overly long recovery periods may also not be desirable. Ensure you are planning your grazing periods with attention to recovery. The length of the recovery period provided to

pastures is managed, ultimately, by (1) the lengths of the grazing events on other pastures and (2) the total number of pastures/paddocks on the operation. While daily movement of animals can certainly be beneficial in many cases, it should be clear that simply practicing daily movement of animals through a rotational grazing system is NOT regenerative grazing. Regenerative grazing is outcome-focused, not practice-specific. Optimal length of a grazing event within a pasture needs to be planned for but also adjusted in the moment based on the desired outcome: the recovery needed across **all** of the pastures in the operation. Manage decisions about length of a grazing event adaptively based on growing conditions and with consideration given to your specific context. *It can be helpful to record your recovery period by month on your grazing chart so you can plan grazing periods accordingly.*

Step 3. Calculate carrying capacity on an Animal Unit Days per Acre (ADA) basis.

- When thinking about carrying capacity, we will express it as the total number of days' worth of grazing that the pasture will produce. Because not every class of animal weighs the same amount, we will express the number of days relative to the intake of a "Standard Animal Unit," which is defined as a 1000 lb cow. *Take your estimated forage availability in each pasture and convert it to Animal Unit Days/Acre (ADA) and record those numbers in the "ADA" column on the left side of the chart*. For more help with grazing math, see the Missouri Grazing Manual or the full guide *Developing a Regenerative Grazing Plan.*



#	Pasture Name	Acres	Animal Unit Days per Acre (ADA)	Pasture Composition
1	Sandy Creek Pasture	23.9	146	CS/WS
2	Old Barn Pasture N	12	291	WS
3	Old Barn Pasture S	12	291	WS
4	Bermuda Rise	14	249	WS
5	Riverside Pasture	23	152	WS
6	Old House Pasture	11.5	303	CS/WS
7	Oak Tree Pasture	21	166	CS
8	Back Forty	14	249	CS
9	Rocky Ford	12.2	286	CS
10	Meadow Pasture 2	18.7	187	CS
11	Little Fescue	10.4	336	CS
12	Middle Fescue	5.3	658	CS
13	South Fescue	15.5	225	CS
14	Little Holler Pasture	7.7	453	CS
16	High Ridge 1	31	113	CS
16	High Ridge 2	19.7	177	CS
16	High Ridge 3	18.6	188	CS
17	East Ridge 1	14	249	Annual
17	East Ridge 2	19	184	Annual
18	East Ridge 3	25	140	Annual
19	Piney Rise	17	205	Annual
20	Crescent Pasture	17	205	WS
21	Rocky Top	34	103	WS
22	New Meadow E	18.5	189	Annual
23	New Meadow W	31.9	109	CS
24	New Meadow N	19.6	178	Annual

This was grazing chart was created as part of the Missouri Climate-Resilient Crop & Livestock (CRCL) project, an effort by the Center for Regenerative Agriculture at the University of Missouri. The CRCL project aims to promote climate-resilient crop and livestock systems through diverse practices, including regenerative grazing, silvopasture, diverse cover crops, and appropriate nutrient management. For more information, visit www.cra.missouri.edu.

Similar grazing charts have been developed and made available by other individuals and entities, and we acknowledge and appreciate their contributions to regenerative agriculture, including: Troy Bishopp, On Pasture, the Madison County Soil & Water Conservation District, SARE, NWI, and numerous others.

Animal Type	Number	Weight (lbs)	AUE	Total AU
COWS	100	1100	1.1	110
Calves	90	410	.41	36.9
Fats	30	750	.75	22.5

Animal Type	Number	Weight (lbs)	AUE	Total AU
COWS	100	1100	1.1	110
Calves	90	455	.45	40.5
Fats	30	900	.8	24

Animal Type	Number	Weight (lbs)	AUE	Total AU
COWS	100	1100	1.1	110
Calves	90	500	.5	45
Fats	30	845	.84	25.2

Animal Type	Number	Weight (lbs)	AUE	Total AU
COWS	100	1100	1.1	110
Calves	90	545	.54	48.6
Fats	30	890	.87	26.7

Step 4. Make an animal inventory.

- **List out each species/class of grazing livestock present on the operation, and the number of head of each that will be present on the first day of the grazing management plan.**
- For nearly all operations, the number of animal units that will be grazed will vary throughout the year. This can be due to changes in animal numbers (e.g., sales of animals) as well as changes in the weight of growing animals. *Put these details in the chart at the bottom of the grazing chart and update each month.*

Calculate the total AU for each species and class of livestock.

- For example, say an operation will begin the grazing season with 100 stocker calves weighing 600 lbs on average, and an Animal Unit Equivalent (AUE) of 0.6 is used for each calf. This group of animals represents 60 AU (calculated as 100 x 0.6 = 60 AU).

Step 5. Mark all important dates on the charts that may affect management decisions.

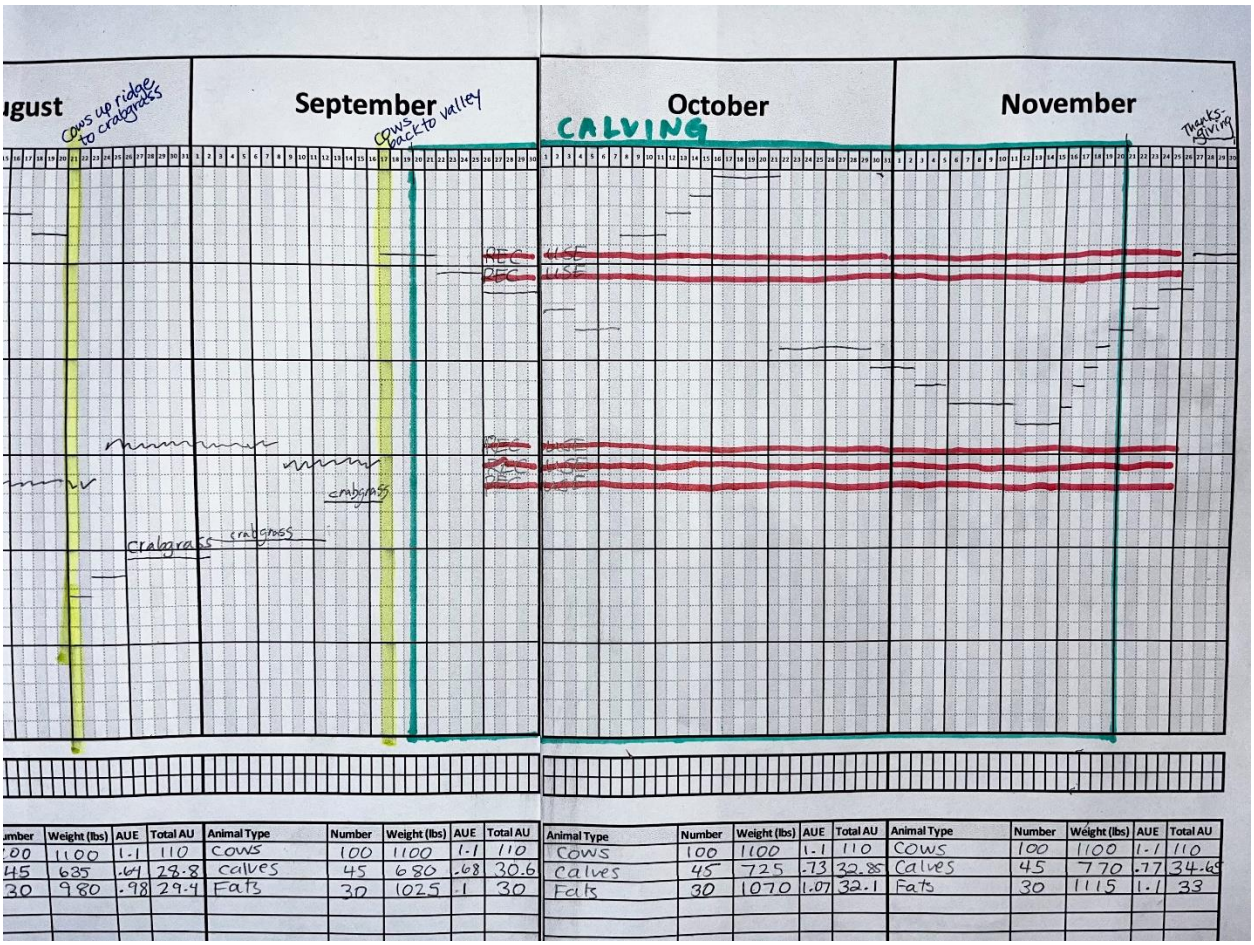
- Include holidays, religious dates, anniversaries, birthdays, planned trips or vacations, etc. If no one will be available to move animals on a certain date, this date needs to be planned around. Marking out dates that are important to you and your team is an important first step to shape the grazing management decisions. *Mark and label these periods with vertical lines on your grazing chart.*

Identify periods during the year in which there are important use limitations, natural resource concerns, and challenges.

- Limitations may include things like avoiding certain mud-prone bottom-ground pastures during seasonally wet periods. Examples of natural resource concerns may include things like seasonally avoiding areas where livestock grazing might disturb hunting, etc. Examples of challenges could include things like no shade for livestock in a certain pasture, limited stockwater access because of a pond that often goes dry in the late summer, etc. *Mark these periods with vertical lines on your grazing chart for each pasture they affect, one line for a beginning and one for an ending calendar date.*

Mark critical time periods on the calendar in which livestock stage of production may have a major impact on your grazing management decisions.

- For example, if managing a breeding herd (e.g., cow-calf operation), indicate the calving and breeding seasons, since cow nutritional requirements will be greatest at these stages of production, marking these can help match your forage resources to nutritional requirements.
- Also indicate any key management events that may need to be planned around. For example, do cattle need to be in pastures with good access to animal handling facilities at certain times of the year? Events like vaccinations, branding, pregnancy diagnosis, artificial insemination or shipping animals may be important to include. *Mark and label these periods with vertical lines on your grazing chart.*



Weight (lbs)	AUE	Total AU	Animal Type	Number	Weight (lbs)	AUE	Total AU
1100	1.1	110	cows	100	1100	1.1	110
635	.64	28.8	calves	45	680	.68	30.6
980	.98	29.4	Fats	30	1025	1	30

Animal Type	Number	Weight (lbs)	AUE	Total AU
cows	100	1100	1.1	110
calves	45	725	.73	32.85
Fats	30	1070	1.07	32.1

Animal Type	Number	Weight (lbs)	AUE	Total AU
Cows	100	1100	1.1	110
Calves	45	770	.77	34.65
Fats	30	1115	1.1	33

Step 6. Begin planning grazing movements! Record when you plan to turn animals in to a pasture, and when you expect to remove them, marking the grazing event on the grazing chart.

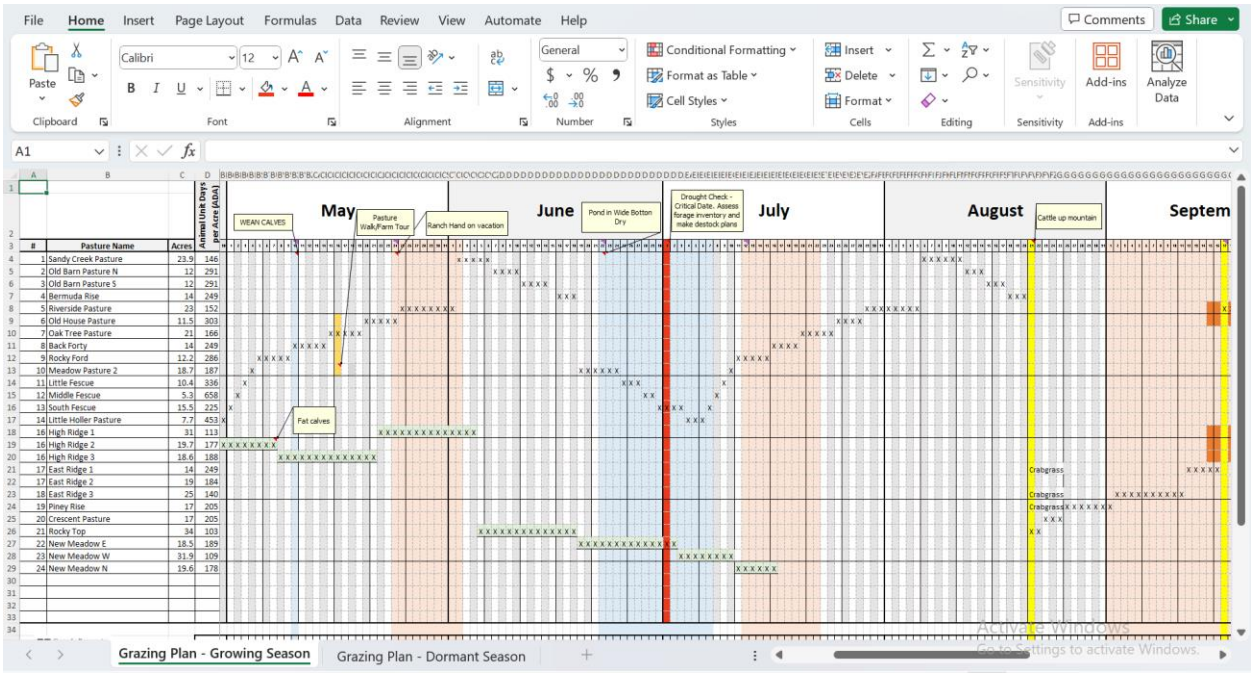
- *For each herd, start filling cells across the row of your turn-in pasture or mark a horizontal line across cells for each planned grazing period/grazing event, corresponding to the planned dates.* One box in the grazing chart indicates a single day. *When the herd moves to the next pasture, hop to the next pasture row and draw a line for the estimated dates you expect that herd to be in the next pasture.*
- Although it may sound counterintuitive, consider planning "backwards"—first identifying any times in the calendar when animals may need to be in certain areas for a key event, for example vaccinating at the corrals, and plan the best way to reach the closest pasture by that calendar date.
- In order to determine how long the grazing period should be in a given pasture/paddock, carefully consider (a) the number of pastures/paddocks available for grazing during the season of the year and (b) the optimal recovery period to provide to pastures after a grazing event.

$$\text{Average grazing period} = \frac{\text{Recovery Period}}{\text{Number of Pastures} - 1}$$

- Finally, mix it up. Livestock operations can too easily repeat management patterns from previous years, grazing the same pastures in the same sequence at the same times of year. It is often helpful to intentionally break some of these patterns, as they can have several downsides (e.g., less diversity of forage species in pastures). Consider starting the grazing season in a different area than the previous year when practical, and try to avoid thinking of certain areas as being assigned to specific seasons, for example, the "calving pasture." Whenever possible and practical, mix it up.

Step 7. Monitor and manage adaptively and re-plan throughout the growing season.

- As you manage day to day throughout the grazing season, *record the days of each actual grazing event on your grazing chart under your planned line – you may want to use a different color to easily compare.* Compare **actual** forage productivity/utilization to date in each pasture with what you estimated at the beginning of the season. An observation that total growth is lagging behind your expectations may influence destocking decisions.
- Include rainfall and snowfall events on your grazing chart below the animal movement portion. Tracking precipitation and its relationship to seasonal forage growth can help predict drought and inform destocking decisions that may be required.
- **Consider the use of "destock dates" to adaptively manage stocking rate in response to drought.** Many progressive grazing operations find it helpful to market animals proactively in response to drought. This can be accomplished by establishing specific destock dates on the calendar at which to reduce the number of animal units on the operation in response to certain metrics. Some operations base destocking decisions on the percentage of total annual rainfall achieved by a certain date. Other operations may make forage inventory measurements and compare them to current stocking rates at the start of seasonally dry periods. Regardless of the metric(s) evaluated, establishing dates to hold yourself accountable to destock is a wise strategy.
- **Monitor pasture productivity.** At the end of the grazing year, take the time to summarize pasture productivity. Add up the total number ADA harvested from a particular pasture for the season. What was the total carrying capacity per acre for the year? Consider the past year's (and ideally multiple previous years') info as you plan next year's grazing.



Step 8. Establish and monitor other important metrics.

- **Monitor soil health and fertility.** Soil health monitoring is strongly encouraged to evaluate changes (e.g., fertility, soil aggregation, water infiltration ability, and water holding capacity). Establish relevant metrics and record baselines.
- Are there animal performance goals that should be monitored, like pounds of calf weaned per acre? What was the profitability of the grazing livestock enterprise(s) and of the overall operation? Are there quality of life metrics that should be monitored among family or employees? What are some wildlife or habitat metrics that could be monitored? **Establishing baselines and monitoring progress towards your established outcomes and goals is what helps make your operation regenerative.**