

# Cell Grazing: Getting Started on Your Place

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## What is Your Compelling Reason for Cell Grazing?

– Kim Barker

**B**efore we begin this discussion of cell grazing, we need to think about the reasons most people are interested in knowing more about it. You have probably heard that you can either increase your stocking rate or run more cows, or you have heard you can increase profits. These are the two most common reasons most people are curious. A smaller number of people are interested because they want to improve their land. If you fall into the first category of only considering stocking rate and profits, you will probably have some serious problems or even fail in your attempt at cell grazing.

The most compelling reason to consider cell grazing is to improve your land. Cell grazing will change your land – no doubt about it. But it is up to you whether that change is good or bad. That is why I say the best reason is to improve your land. If you are only interested in increasing profits or stocking rate, you will most likely not pay close enough attention to the land to avoid the wrecks that can and likely will happen if they are not caught early enough to take corrective action. If you increase stocking rate without paying close attention to the land, you are headed for disaster. If you begin cell grazing at all without paying close attention to the land, you are headed for disaster.

Planning is imperative for success. The terms "planned grazing" or "planned cell grazing" are much better than just cell grazing or rotational grazing. This planning process includes the goal you are trying to reach with

your grazing management, what you want the land to be like in the future, what income is expected from the land, the fence and water design necessary to accomplish these things, and finally the actual grazing planning of when and where livestock will need to be to reach the goal.

This may sound really scary and intimidating, but the alternative is a hit-and-miss approach that leads you nowhere. Consider this: Every fertilizer and chemical salesman has a plan for your land, every veterinary supply salesman has a plan for your land, and the writers of the farm bill have a plan for your land. Don't you think you should have one too, so you can say no to theirs?

I found this quote in an article on strip grazing from the *Farm Quarterly*, Summer 1957, that sums up what we are talking about.

"They all had good cows, freshening at the proper time to make full use of the excellent pasturage. And that excellent pasture did not just happen. It was planned and nurtured to the point where, as one observer noted, 'It almost makes milk without the cows.'"

There are three very important points in this short quote, the pasture was planned, it was nurtured, and the cows freshened at the proper time. These three are truly the keys to success. So before you do anything about beginning cell grazing on your place, think carefully about what your compelling reasons are for doing so.

*See page 44 for more information on Kim Barker.*

# Common Grazing Mistakes

– Walt Davis

Perhaps the most common mistake made by beginning graziers is to get caught up in the mechanics of fence design and construction rather than striving to learn the principles needed to succeed with planned grazing. Moving livestock from paddock to paddock makes sense only if it is done in such a manner so as to benefit the livestock, the land and the graziers' bank account.

Proper grazing is not destructive to the forage base but rather acts to increase the health and vigor of grasslands. To achieve this requires an understanding of the relationships between forage and grazing animals and how these relationships can be used. It is critical that the grazer understand the importance of timing of defoliation both to the plant and to the grazing animal.

The leaf is the energy producing structure and as such is vital to the health of the plant, and it is also the most valuable part to the grazing animal. To thrive, a plant must have sufficient quality growing time to recover from the effects of grazing before it is defoliated again. The plant must have sufficient recovery time but if it rests too long, its value to the grazing animal declines and the rates of nutrient cycling and energy flow slow for the whole soil-plant-animal complex.

The time needed for recovery depends upon growing conditions, growth characteristics of the grazed plants and the severity of the previous defoliation. Good grow-

ing conditions mean short recovery times, while poor conditions mean longer recovery times. It is feasible to arrive at average recovery periods that take into account the three factors and use these as starting points in planning.

It is absolutely necessary, however, to closely observe how plants and animals are performing and to change the recovery periods and perhaps the stocking rates to produce the desired results. Movement of animals cannot be based upon the calendar but rather must be based upon the rate of growth of the grazed plants! Decisions must be made on the basis of conditions of all parts of the grazing area. Look at conditions in the area being grazed now but also in the areas to be grazed tomorrow, next week, and next month.

## Fencing and Water Considerations

The purpose of fencing in grazing management is to enable the grazer to determine when and how severely forage is grazed. In general, the shorter the time an area is exposed to grazing the more opportunities for good animal performance, for good efficiency of grazing and for improvement to the soil-plant base. An ideal situation might be to have enough paddocks for each herd so that during periods of good growing conditions graze periods could be held to one day.

## About Walt Davis

Walt Davis is a fifth generation rancher with interests in southeastern Oklahoma and west Texas. He grew up on the Texas ranch working with cattle, sheep and goats. He attended Texas A&M College where he completed a BS degree in animal husbandry and eighteen months graduate work in animal breeding.

In 1962 he took over as manager of the Oklahoma property and established a high tech operation using the best practices of soil fertilization, weed control, animal health and animal nutrition supplementation.

This approach resulted in tremendous production but very poor profitability and an obvious decline in health of the local environment. In 1974 the decision was made to shift the management of the operation toward a lower input, more sustainable program.

It was soon apparent that making this management successful would require a better understanding of grassland ecology, grazing management and of how forages and grazing animals interact. This started a search for knowledge and

re-education that continues today. The change in management philosophy has resulted in an operation that is both more profitable and more stable.

The health of the soil-plant-animal complex has increased with a corresponding decrease in plant and animal diseases and pest organisms. The need for pesticides of all types has been greatly reduced and in most cases eliminated. No purchased fertilizer material has been used in twenty years but soil productivity continues to increase. Perhaps the greatest change is the fact that today both the people and the animals of Davis Ranch enjoy their lives.

Walt is a past president of both HRM of Texas and HRM of Oklahoma and works, since 1986, as a management consultant with clients in both arid and humid regions.

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Cells with less than 12 – 16 paddocks will be very hard to operate without giving up animal performance. If stocking rates are correct, recovery periods are correct and grazing periods are short; livestock will be content and very easy to control. If animals are constantly escaping the fence, it is very likely that one or more of these factors are out of balance.

In a well-designed and operated grazing cell, cattle can be controlled with a single electric wire at thirty inches. Sheep or goats will normally require two or more wires. Since a major goal of grazing management is to graze forage at the proper physiological age, areas with forage of differing maturity rates should be fenced separately. The same is true of areas with widely differing productive capacity or seasonality of production.

Water development is the expensive part of cell develop-

ment, but quality water in sufficient quantity is essential. Water points that were adequate with continuous grazing may be inadequate with the higher stock densities of cell grazing. Piped water delivered to float controlled drink tanks is superior to watering in dirt ponds and often less expensive. Ideal would be to have a separate water point in each paddock but this is seldom financially feasible. More realistic is to plan for water points to be shared by two or more paddocks in such a way as to hold areas in continuous use to a minimum and to maximize the flexibility of the design.

Major thought and planning should go into designing water and fencing before any construction is begun. Plan the entire operation as if you were going to build it all tomorrow and then build the portions that give the greatest benefits first.

## Sustainable Grazing for Profit

–Charles Griffith

### Plant Physiology–Plant and Animal Relationships

#### How Do Plants Grow?

Plant leaves collect energy from the sun. In the presence of CO<sub>2</sub> and H<sub>2</sub>O, and through the process of photosynthesis, they manufacture carbohydrates and sugars that feed the plant. The carbohydrates and sugars are for growth, reproduction, storage and respiration. It is estimated that 95 percent of plants' needs come from the sun. Therefore,

plant leaves are solar panels and are vital to the health and vigor of a plant. This makes our ranches solar collectors of energy from the sun.

About five percent of a plant's needs come from the soil in the form of plant nutrients and water. Primary nutrients are nitrogen, phosphorus and potassium. These nutrients, if deficient, will drastically affect the health of a plant. Secondary nutrients are calcium, magnesium and

### About Charles Griffith

Charles Griffith recently retired from the Noble Foundation. He lives on a pecan and cattle operation near Ardmore, Oklahoma.

"I spent 37 years as a Noble Foundation forage specialist, helping area farmers and ranchers through farm visits, one-on-one consultations, publications and presentations. My recommendations were based on creating ecological soundness and environmentally friendly practices and now I am a major supporter of Holistic Management techniques and sustainable agricultural procedures.

"Holistic Management opened a new door of opportunity for me in managing land resources. In 1987, I was given the responsibility for forage research and management on the Coffey ranch, a Noble Foundation demonstration and research ranch. This proved to be the most convincing and driving force that using the guidelines and management principles of Holistic Management would lead to doubling the stocking rate and reducing production costs and overwhelming increase the profitability of the ranch operation.

"Being retired I could do lots of things as retired people do, but I feel I have so much knowledge and experience that I should make it available to those that are managing land resources. I believe in family farms and ranches."

#### Memberships:

Griffith is a member of the Oklahoma Cattlemen's Association, Oklahoma Pecan Growers Association, President of Oklahoma Land Stewardship Alliance, past board member of HRM of Texas and served 4 years on the Professional Development Committee of Southern Sustainable Agriculture Research and Education Program.

#### For more information

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sulfur. Testing the soil can check both primary and secondary nutrients. Minor nutrients are iron, manganese, boron, molybdenum, zinc, copper, sodium and chlorine. Minor nutrients play a minor role in plant growth. Very seldom is there a need to amend soils with minor nutrients. However, animals eating plants deficient in minor nutrients may suffer. It is a good idea to test plants for minor nutrients at least one time. A mineral supplement will supply these nutrients.

Soil organic matter broken down into humus through biological activity within the soil becomes a virtual sponge for releasing all nutrients to the plant root system. Therefore, managing grasslands to maintain soil organic matter should be a management priority. A plant nutrient missing from the soil will affect the normal health and vigor of the plant.

Plant defoliation studies reveal that a plant can give up to 50 percent of its leaves without dramatically affecting the root system of the plant. This means that if 50 percent of the plant leaves are removed from the plant, it is not affected physiologically and will continue to be healthy and growing. Herbaceous plants evolved under a system by being bitten by foraging animals.

### **How Do Plants Relate to Grazing Animals?**

There are factors affecting a plant's response to grazing. These are grazing frequency, intensity, season of use and animal selectivity.

We can identify three growth stages in the growth cycle of a plant. Stage I is when a plant begins to initiate new growth after a long period of dormancy, or following severe grazing and/or being cut for hay. Plant growth, or re-growth, is very slow as new leaves begin to develop. The process of photosynthesis is slow until enough leaves develop to create a new food supply for the plant.

Perennial plants live on food reserves stored in the crown and roots of the plant during the dormant period. As perennial plants near the end of a dormancy period, food reserves are at the lowest point in the life cycle of the plant. The plant is weak trying to grow and restore its food reserves. The new plant leaves at this stage are high in forage quality but very limited in forage volume. The development of new leaves is critical to the plant and removing leaves by severe grazing is a shock and detriment to the plant. When a plant is recovering from being cut or by a severe grazing, it again pulls from food reserves to initiate new growth.

As more leaves develop, plant growth begins to excel. Growth becomes very rapid –creating an explosion of forage quantity. This abundant growth is Stage II. Forage quality is less than Stage I, but sufficient for excellent ani-

mal performance for most all classes of grazing animals.

Growth Stage II is ideal for animals to graze a plant. However, this is where grazing intensity and frequency becomes a vital part of the health of the plant and optimum animal performance.

As plants mature, they enter growth Stage III. Stage III plants develop a higher stem-leaf ratio and become structurally sound. As maturity advances, plants begin seed reproduction with the development of seed heads. Much of the energy within the leaves of the plant is transferred to the seeds. Forage quantity is great, but the vegetative parts of the plant are much lower in forage quality. Good animal performance is limited for certain classes of livestock. Plants are very deficient in protein.

### **Negative Effects of Grazing on Plants**

Herbaceous plants evolved by being exposed to grazing animals. The exposure was intermittent – leaving periods for the plant to recover. In order to maintain a healthy plant, it becomes necessary to limit the exposure to a short graze period and then allow a long rest period. A plant's constant exposure to a grazing animal prevents the plant from having a chance to recover.

Animals choose plants and/or plant parts based on fulfilling their nutrient requirements. Therefore, animals select and graze individual plants. When a plant is continuously exposed to a grazing animal, based on its palatability and nutrient supplying ability, then that plant becomes subject to severe stress.

### **Tools for Managing Plants for Optimum Growth and Plant Performance**

#### **Plant Rest**

Plant-rest is defined as being total, partial or no rest.

*Total rest:* when a plant is excluded from exposure to a grazing animal. Total rest may seem appropriate initially, but over a period, the plant will begin smothering and a process of dying.

*Partial rest:* defined as a plant bitten by a grazing animal and then the animal is removed for a given recovery period. It is under this system that plants are healthy and maintain their root systems and plant vigor. Partial rest is the correct tool and necessary for proper grazing management. Partial rest control by the manager will depend on the soil's nutrient supplying ability, climate and plant species. Considering these variables, the manager will decrease or lengthen the grazing and rest period. Plant rest will differ for the same species growing in an arid environment vs. growing in a humid environment. Plant species differ in their requirements for recovery. Farm forages, such as Bermuda grass and legumes, require a shorter rest than native plants. Annual plants require a shorter

rest than perennial plants.

*No rest:* when a plant is exposed continually to a grazing animal. As mentioned above, this is very detrimental to a plant. Plant survival is at risk under continuous grazing.

### **Grazing**

We seldom consider grazing as a management tool. Grazing takes in account stocking rate and types of animals grazing.

*Stocking rate* – Stocking rate is the number of animals grazing for a unit of land. Stocking rate is determined by knowing the forage production capacity of a unit of land for a given period.

*Species and class of animals* – It is important to choose the right species and class of animals in order to make optimum use of a given herbaceous plant community. Species defines differences such as goats or cattle, whereas class would be to define an age group within a species.

### **Fire**

Herbaceous plants evolved under natural fires set by lighting. Fire can have positive and negative effect on the land and plant community. Populations of undesirable species such as Red cedar will decrease, while other undesirable species as Sericea lespedeza and blackberry will increase. Fire will remove litter and cause erosion and a negative effect on the water cycle.

Fire will remove old growth from previous years and its removal will increase animal performance. Most often when an area is scheduled to be burned, it is rested during the previous growing season. After a burn, plants are very vigorous as green-up begins in the spring. This vigorous growth is often contributed to the fire, when actually it is the results of the rest period prior to the fire. I mention this to stress that we should use the right tool

where needed.

Fire used with caution is to address certain needs. It is to be planned to address a problem with the right intensity and frequency.

### **Animal Impact**

Animal impact is the role the livestock imply on the land as a part of the grazing and roaming activities. Do animals graze dispersed over a wide area or as a herd grazing at a very high stock density?

Stock density is not to be confused with stocking rate. Stock density is a measure of the number of animals or pounds of animals grazing on an acre of land in a given period. Stocking rate is the number of animals grazing the entire unit of land and is measured as acres per animal unit. The action of herd animals, as stock density increases, will remove plant selection and increase harvest efficiency. A herd of animals will create soil disturbance, concentrate urine and dung, and will affect problem plant species.

### **Living Organisms**

Living organisms take in both animal and plant community dynamics. It is important that all components be in place for the process of re-cycling all organic carbon.

### **Technology**

Technology includes machinery, chemicals and fertilizers. This is the most often used tool and used to provide quick fixes. As an example, we use chemical weed control in place of good grazing management. The manager must decide on a tool that will provide a cure for a given problem and will advance the animal and plant community toward an economic and sustainable goal. Tools are to be used in combination and not any one tool will stand on its own as a cure all.

# Monitoring for Success

–Kim Barker

**M**onitoring is the key to knowing what you are doing right and what you are doing wrong. Failure to monitor makes it impossible to learn from our mistakes. If we do not monitor, we don't know what we did wrong, or when we did it. Planned cell grazing for the purpose of improving land is like flying an airplane. It takes practice, you must know what to do with the information you are constantly receiving, and things can happen very fast.

It is important to monitor the land to see that what you planned to happen actually is happening. If it is not, replanning immediately is essential. It is important to monitor finances so you don't get to the end of the year and wonder what went wrong. Monthly monitoring keeps the profits on track. It is also important to monitor socially, or the people. People are the key to the success of the other two pieces we are monitoring. If the people do not understand what is going on, they may be unintentionally sabotaging the plan. The people I am talking about may be family, spouse, employees, or even YOU!

Monitoring simply means deciding what early warning criteria you will use to determine if you are on pace to meet your goal, and then looking at those indicators to see what is happening. On the land, it may be amount of litter on the ground, bare ground, species shift, seedlings, erosion, or most likely all of the above. It is a good idea to do detailed monitoring once a year, but to pick out a handful of indicators you will look at every time you move livestock. Financially, monitoring monthly is usually adequate, unless you know markets are falling, or production is lagging or you have reason to know future cash flow is at risk. Socially, make sure everyone is on the

same page, all the time. Temporary lapses can cause serious problems, and can turn into deeper problems, especially if not handled quickly.

Whatever form your monitoring takes, make sure it is something you will actually do. It does no good to choose an elaborate plan for monitoring that gives you tons of good information, if it is too complicated to do quickly and easily. It is better to choose a simple set of indicators that can be checked quickly and easily that tell you the trends without a lot of time spent in the intricate details that can bog you down.

Success is in the plan you develop for your ranch, and the success of the plan is in the monitoring. Define the terms of your success by developing the plan, then follow through with monitoring to make sure the plan is getting done, and to make sure that the plan was correct to begin with.

Edward De Bono wrote, "Progress comes from thinking about things that are not problems." Planned grazing is thinking about ways to avoid problems, to solve the ones that can't be avoided, and to think about the things that are not problems so progress can be made.

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*See p. 44 for Barker's presentation, Introduction to Planned cell Grazing: How I Got Started.*