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Rotational Grazing

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Contents

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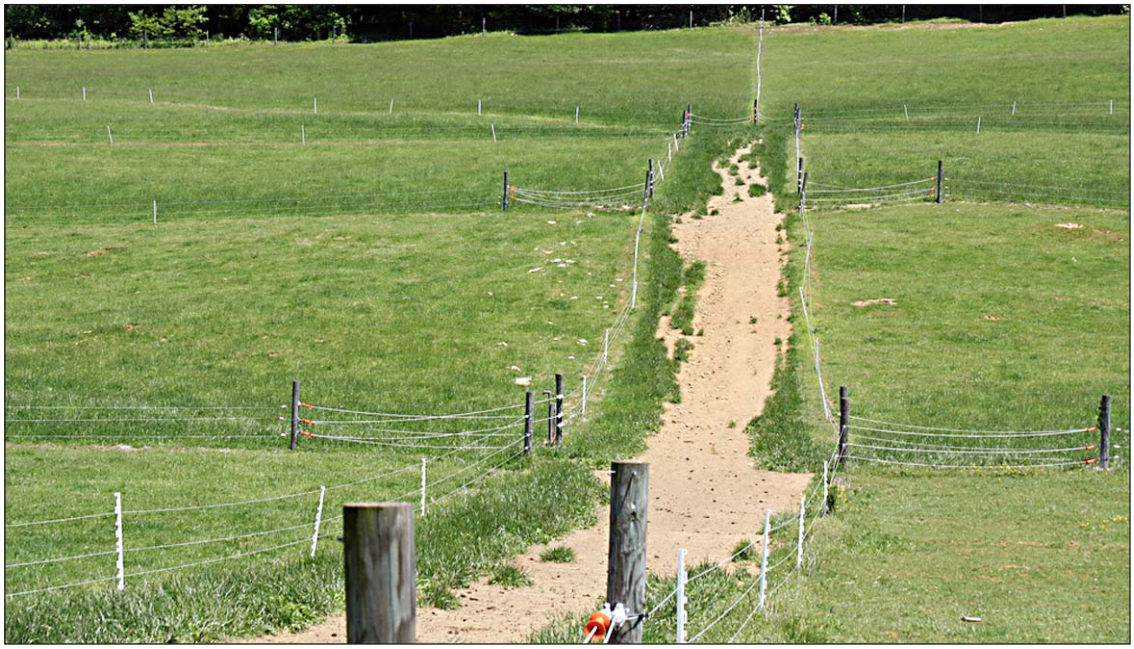
Rotational grazing is a grazing management strategy characterized by periodical movement of livestock to fresh paddocks to allow pastures time to regrow before they are grazed again. Some popular rotational grazing systems include Management-intensive Grazing, multiple-pasture rotation, and short-duration grazing (Gerrish, 2004; Hanselka, et al., no date). Other names include cell grazing and controlled grazing. There are slight differences between how practitioners of each type of system may describe how they work, but they are all basically predicated on adequate rest periods to allow for adequate forage regrowth.

Rotational grazing requires skillful decisions and close monitoring of its consequences. Modern electric fencing and innovative water-delivery devices are important tools. Feed costs decline and animal health improves when animals harvest their own feed in a well-managed rotational grazing system. Included are lists of resources for further research and other ATTRA publications related to rotational grazing.



A well-designed rotational grazing system including a nice permanent lane and paddocks subdivided with electric polywire. Photo by Susan Schoenian.

Introduction

Ruminants such as cattle, sheep, and goats can convert plant fiber—indigestible to humans—into meat, milk, wool, and other valuable products. Pasture-based livestock systems appeal to farmers seeking lower feed and labor costs and to consumers who want alternatives to grain-fed meat and dairy products. The choice of a grazing system is key to an economically viable pasture-based operation.

Adding livestock broadens a farm's economic base, providing additional marketable products and offering alternative ways to market grains and forage produced on the farm. In addition, soil losses associated with highly erodible land used for row crops decline when such land is converted to pasture. Besides these benefits, rotating row crops into a year or two of pasture increases organic matter, improves soil structure, and interrupts the life cycles of plant and livestock pests. Livestock wastes also replace some purchased fertilizers.

Because ruminants co-evolved with grassland ecosystems, they can meet their nutritional needs on pasture. A profitable livestock operation can be built around animals harvesting their own feed. Such a system avoids harvesting feed

mechanically, storing it, and transporting it to the animals. Instead, the livestock are moved to the forage during its peak production periods. Producers manage the pasture as an important crop in itself, and the animals provide a way to market it.

Reduced feed and equipment costs and improved animal health result from choosing species well-suited to existing pasture and environmental conditions. In most operations, a good fit between animals and available pasture provides more net income. ATTRA's publication *Ruminant Nutrition for Graziers* goes into more depth on this subject.

Some animals will produce acceptable meat with little or no grain finishing. Marketing these lean meats directly to consumers is an opportunity to increase profits. Skilled managers who can consistently offer high-quality forage to their animals, producing lean and tender meat, should consider pursuing this market.

Choosing a Grazing System

Continuous grazing, the most common grazing system in the United States, often results in overgrazing and an increase of less-desirable plant species. When livestock graze without restriction, they eat the most palatable forage first. If these plants are repeatedly grazed without allowing time for their roots to recover and leaves to regrow, they will die. Plants not eaten by livestock mature and go to seed. Thus, populations of undesirable plants increase, while preferred plants are eliminated, reducing the quality of the forage in a given pasture. Trampling and animals' avoidance of their own wastes further reduce the amount of usable forage.

Continuous grazing has the benefit of low capital investment, since fewer fencing and watering facilities are required than with rotational grazing systems. Because livestock are moved less frequently from pasture to pasture, management decisions can be simpler. Some research demonstrates that rotational grazing and continuous grazing have similar effectiveness on rangelands (Briske, et al., 2008). However, many range managers utilizing rotational grazing systems on rangeland have reported increased range health and animal performance (Sayre, 2001). Continuous grazing frequently results in higher per-animal gains than other grazing systems, as long as adequate forage is available to maintain high growth rates. But if overgrazing occurs, desirable plant growth rates will dwindle.

Rotational (or controlled) grazing, on the other hand, increases pounds of animal production per acre. How the system is managed influences the level of production, of course. In fact, Management-intensive Grazing (MiG) is another term for rotational grazing. This term emphasizes the intensity of the management rather than the intensity of the grazing.

MiG is grazing and then resting several pastures in sequence. The rest periods allow plants to recover before they are grazed again. Doubling the forage use is often possible by changing from continuous to controlled grazing. There is considerable profit potential for the producer willing to commit to an initial capital investment and increased management time (Kole, 1992). The producer can meet individual animal gain or gain-per-acre goals with sound management decisions.

Faced with low milk prices, the potential loss of price supports, and ever-rising costs, some dairy producers have changed to MiG to meet economic and quality-of-life goals. Some are providing cows fresh paddocks after each milking. Seasonal dairying—drying off the entire herd during times when pasture production is low—is often the next step, but it requires even more skillful management and may not be as profitable. For more information, see the ATTRA

Temperate pasture – Temperate pastures are typically very productive. They are characterized by well-developed soils, medium to high precipitation, and moderate to rapid nutrient cycling. They can be dominated by warm- or cool-season plants and occupy niches from Maine to Florida, from Texas to Minnesota, and from Southern California to the Pacific Northwest coastal regions of Washington and Oregon.

Rangeland – According to the Society for Range Management, rangelands are a type of land on which the natural vegetation is dominated by grasses, forbs and shrubs and the land is managed as a natural ecosystem (SRM). In North America, rangelands include the grasslands of the Great Plains stretching from Texas to Canada, from the prairie states of the Dakotas and Nebraska, to the intermountain states and the annual grasslands of California.

Related ATTRA publications

Pastures: Sustainable Management

Pasture, Rangeland, and Grazing Management

Pastures: Going Organic

Assessing the Pasture Soil Resource

Paddock Design, Fencing, and Water Systems for Controlled Grazing

A Brief Overview of Nutrient Cycling in Pastures

Nutrient Cycling in Pastures

Converting Cropland to Perennial Grassland

Ruminant Nutrition for Graziers

Multispecies Grazing

Grazing Networks for Livestock Producers

Protecting Riparian Areas: Farmland Management Strategies

Managed Grazing in Riparian Areas

Dung Beetle Benefits in the Pasture Ecosystem

An easy way to begin MiG

It is often suggested, as an easy way to begin MiG, to subdivide existing pastures with one or two fences (or simply close existing gates). Managing these simple divisions is a chance to try out a more controlled system and begin learning this type of grazing management at a basic level. If the new fences are electrified high-tensile wire, animals will learn to respect them, and managers can practice handling them. The manager's observation skills develop as the animals and forages adjust to the change.

However, Dave Pratt, CEO of Ranch Management Consultants, Inc., notes that starting with what you have and building off it leads to cumbersome and more costly designs in the long run. Instead, Dave counsels would-be graziers to start from scratch and take a fresh look at everything. The existing fences on a farm were probably not laid out and constructed with rotational grazing in mind (Pratt, 2010). Starting with a ranch map that delineates soil and vegetation types as well as annual forage productivity and designing a grazing system from the ground up will produce a much more workable system than constructing grazing paddocks piecemeal.

publications *Dairy Production on Pasture: An Introduction to Grass-Based and Seasonal Dairying* and *The Economics of Grass-Based Dairying.*

MiG can be used in many other operations as well. Cow-calf and stocker operations benefit from increased forage and higher-quality feed under MiG. Some graziers specialize in dairy beef or in raising replacement heifers for dairy operations. When MiG is used with sheep and goats, fencing must be excellent in order to keep the livestock in and the predators out. (Guard animals can enhance predator protection. More in-depth information about guard animals is available from ATTRA.)

Economically successful rotational grazing requires careful analysis including whole-farm planning. Livestock require large capital expenditures relative to their value, and being profitable with MiG on a small scale is not guaranteed. This is because small operations often don't have the scale necessary to justify the infrastructural improvements needed for intensive rotational grazing (Pratt, 2010). This necessitates minimizing the cost of improvements as much as possible. A single strand of electric tape and temporary posts for interior paddocks instead of permanent interior fencing is a good way to reduce infrastructure costs.

Making the Change

When making a change in grazing management, a logical first step is an inventory of the farm's resources. An aerial map of the farm is useful to mark fences, water supplies, and existing forage resources. Writing down farm and family goals in this process makes it easier to stay on course with management decisions. When a salesperson is applying pressure, for instance, it helps to be able to evaluate the cost of the product against some chosen goal.

Implementing rotational grazing requires subdividing the land into paddocks, providing access to water, adjusting stocking rates, and monitoring grazing duration. These decisions may seem overwhelming at first. Some of the reference materials listed at the end of this paper offer information about setting up paddocks to fit the landscape, calculating stocking rates, and estimating forage yield and availability. For more information, see ATTRA's *Introduction to Paddock Design, Fencing, and Water Systems for Controlled Grazing.*

The change to controlled grazing will have impacts on the animals, the plant community, and the farmers. Livestock operators who have not monitored their livestock daily or weekly will feel the greater time demands. On the other

What do you expect to get from a rotational grazing enterprise?

- Identify problems to overcome and opportunities you can take advantage of
- List your on-farm assets
  - land
  - livestock
  - forages
  - water
  - lanes
  - buildings
  - machinery
  - sensitive areas (such as riparian areas)
  - wildlife
- Match your grazing goals to your resources to determine the feasibility of a rotational grazing enterprise.

hand, the need for harvested forages declines, resulting in less time spent making hay or silage. Purchased feed costs also shrink.

Economic benefits come from improved animal health and increased production. Research confirms lower feed costs and fewer vet bills on most operations making this transition.

Actual figures vary widely, depending on the profitability and forage condition under the old system. As the new system is fine-tuned, feed quality improves, quantity increases, and management skills also grow. As a result, more animals can be raised on the same acreage, translating into more income for the farm.

It takes commitment to succeed in making the change to MiG, a system requiring more complex management skills. Old ways of thinking will need to shift as analytical and problem-solving skills develop. The new grazier's commitment will be tested by mistakes, unexpected weather patterns, and neighbors' attitudes.

Fencing and Water Systems

Rotational grazing requires additional fencing. High-tensile electric fencing is cheaper and easier to install than conventional fencing. Temporary as well as permanent electric fencing is available, and many producers use a combination of the two. This equipment offers flexibility in managing animal and plant resources.

Polywire and polytape are essential for quickly and efficiently setting up grazing paddocks. Conductive wires are braided into the polywire/tape and connected to a fence charger to electrify the temporary fence. These materials can easily be installed from a spool, supported by temporary metal or fiberglass posts, to make paddock set-up a quick job. Photo courtesy USDA-NRCS.

Permanent perimeter fences should be well constructed to keep cattle off highways, away from riparian areas, or off the neighbor's pastures. A single electric wire can run the length of the perimeter fence to provide a charge to temporary paddocks wherever you need them. Photo courtesy USDA-NRCS.

Animals need to be trained in electric fences. Producers sometimes use a special paddock for introducing new stock into the system (fencing suppliers can furnish information). Once animals learn to respect the electrified wire, it becomes a psychological rather than a physical barrier.

Providing water is another capital requirement of rotational grazing systems. Experienced producers soon see the value of adequate water, and some regret that they did not invest more in the water system initially. Designing a water system for future expansion may be the best option for beginners with limited funds.

Many producers use pipes and portable waterers to create movable water systems and design permanent systems based on this experience. Flexibility in locating water within paddocks should be part of any final design, so the manager can control animal distribution and avoiding trampling around the water source.

Some paddocks have alleyways that give animals access to one water source from several side-by-side paddocks. However, the area around a permanent water source will suffer from heavy traffic. This heavy-use area tends to accumulate nutrients and is a potential source of parasites, disease, and erosion. (Many producers see the same problems in any location where animals congregate, e.g., shade trees and mineral sources.)

Water sources should be strategically placed to ensure animals have access from each paddock in the grazing cell. This permanent water source allows access from a lane that leads to successive grazing paddocks. Photo courtesy USDA-NRCS.

Heavy livestock traffic around ponds, springs, or streams can destroy vegetation. Piping water away from these sources or limiting animals' access results in higher-quality water for them, and it benefits wildlife habitat. Some producers report economic benefits from providing cool, high-quality water, though little research exists.

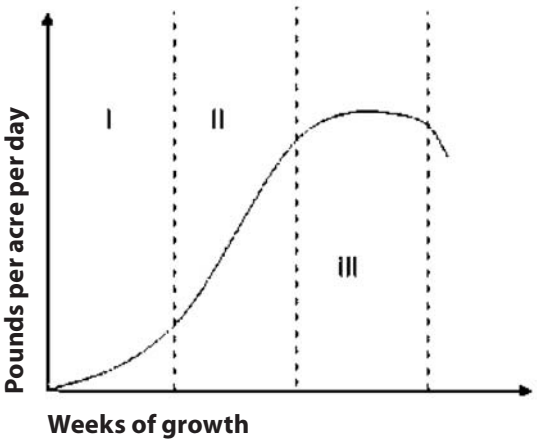
Mineral blocks are typically placed near the water supply, but excessive use of the area can lead to the problems mentioned above. Placing the minerals away from water or other gathering areas helps redistribute the animals' impact and avoids overuse of any one area. Dispensing soluble minerals in the water is another alternative. For more information on fencing and water, see ATTRA's *Paddock Design, Fencing, and Water Systems for Controlled Grazing.*

Forage Growth

How much pasture area to offer animals and how long to keep them there are critical decisions for a successful grazier. These decisions influence the amount and quality of forage available throughout the grazing season.

Figure 1 shows the natural progression of forage growth through three stages. Phase one is the first growth in the spring or the time required for regrowth after extreme defoliation. Photosynthesis is low because of the small leaf area available to capture solar energy.

Figure 1. Forage Growth Curve



During phase two, plants grow rapidly because leaf area is increasing. Toward the end of this growth phase, forage growth is near its peak, and it is of high quality. This lush and abundant forage is ideal for grazing.

The transition from phase two to phase three marks the beginning of reproduction and slower plant growth. Lower leaves begin to die as they are shaded out by those above. Plant resources are used for reproduction rather than more growth, and forage quality declines.

Managing Forage Growth

The grazier manages this forage growth-curve to keep pastures producing a maximum amount of high-quality forage. Decisions about moving animals from paddock to paddock are based on the amount of forage available, size of paddocks, and estimated seasonal growth rates. The number and nutritional needs of the livestock must also be figured into this balance.

After each grazing period, if adequate leaf area is left for photosynthesis, plants quickly replace leaves lost without depleting root reserves. The animals are moved to fresh, succulent pasture before plants are overgrazed. Thus, the plants and animals both benefit from good grazing management.

Many desirable plants, including legumes and native grasses, disappear from pastures that are

not given adequate rest. Animals must be moved after three to five days, maximum, to prevent them from grazing these plants' regrowth.

If not removed from the area, livestock will preferentially graze certain forages and deplete root reserves, thus killing the most palatable forage species. Uncontrolled grazing thus eliminates desirable species and maintains those that can tolerate repeated defoliation, such as tall fescue.

Management-intensive Grazing encourages a wide variety of plants in the pasture. Plant diversity increases in adequately rested pastures. Plants adapted to the varied soil and moisture conditions of the landscape thrive in their microclimates. Animals can graze plants during their seasons of maximum palatability.

Management-intensive Grazing encourages a wide variety of plants in the pasture.

Livestock will, in fact, eat many weeds in their vegetative stage, some of which are good feed. By eating weeds such as dandelions, quackgrass, redroot pigweed, and lambsquarters when they are young and tender, grazing animals keep both annuals and perennials from going to seed. These plants have been shown to have feed values that compare favorably with oats (Marten, 1978).

Dairy or fast-growing meat animals will need energy or fiber supplementation at certain times of the season, depending on what they can graze for themselves. Since what livestock eat is different from a random profile of the plants in the pasture, forage samples or harvested forage tests will not exactly reflect true animal intake. It is, therefore, difficult for the manager to know whether protein or energy supplementation is economically justified. There are rules of thumb, though. For example, high-producing dairy cattle will likely need energy supplementation when on high-quality cool-season pasture, to help them maintain body condition and adequately metabolize the protein they are getting from the forages. In addition, high-producing cattle on warm-season forages such as Bermudagrass may need protein supplementation, especially in the dormant season when protein content is low in the forages. Protein supplementation also increases the rate of passage of forage in the animal's rumen, thereby increasing forage utilization. Supplementation on pasture is therefore a matter of providing extra nutrients to make up deficiencies, and not as a substitution for the forage that is there.

Other than salt, the need for mineral supplements is likewise difficult to determine. If soil tests show that micronutrients are missing, they can be added to the mineral mix. However, some may be present in the soil but unavailable to the plants. Adjusting pH often remedies this. While some consultants argue that missing micronutrients should be applied to the soil so they can be eaten as plant material, mineral supplements are often the most economical solution. Minerals not removed by grazing will cycle with other nutrients in the pasture as the years go by.

Seasonal Adjustments

Rotational grazing gives the livestock manager flexibility in responding to the changing forage supply. During periods of rapid plant growth, cattle are moved quickly through paddocks. Alternatively, if equipment is available or the work can be hired, excess forage can be harvested for feeding later. During periods of slow plant growth, delayed rotation allows plants in each paddock a longer time to recover after each grazing period.

Various strategies or specialized forages can delay having to feed harvested forages. In late fall, stockpiled fescue or other winter grasses can be strip-grazed. Grain and stalks left in corn or milo fields after harvest, offered as strips, provide another source of good-quality feed into the winter months. Small grains, grown alone or with brassicas, are a third option in some parts of the country for extending the grazing season.

In some regions, providing excellent grazing through the hottest summer months is the biggest challenge. Native grasses, summer annuals, and interseeded legumes can offset this slump. However, the costs of establishment—in time and money—are justified only if the resulting increase in livestock production translates into sufficient profit. A good resource for learning more about extending the grazing season with alternative forage systems is the *Extending Grazing and Reducing Stored Feed Needs,* by Don Ball, Ed Ballard, Mark Kennedy, Garry Lacefield, and Dan Undersander, available online at *www.agrypurdue.edu/Ext/forages/pdf/ExtendingGrazing-Auburn.pdf.* The ATTRA publications, *Pastures: Sustainable Management* and *Pasture, Rangeland, and Grazing Management,* provide further information on this subject.

Effects on the Animals

Multiple paddocks make access and handling easier. Cattle become easier to work when they see people as the source of fresh pasture. Managers who observe their animals frequently can identify and treat health problems in their early stages.

If just beginning an animal operation, the producer should choose a breed adapted to the climate and grazing system or pick individual animals with good performance records on pasture. Some types of animals, even within a breed, can better use high-quality forage, and others are better adapted to low-quality rangelands. Some tolerate legumes without bloating.

There is as much variation among individuals within the breeds as between breeds. To some extent, animals learn grazing skills (Forbes, 1995). Therefore, animals that have been raised on pasture—especially those from a controlled grazing system—are desirable. In an established herd, culling animals that don't adapt is essential to achieving a profitable grass-based livestock system.

Grazing Planning and Economics

A grazing plan helps producers visualize and anticipate the various changes that occur during the grazing season. Some of the factors to track in a grazing plan include grazing land inventory, such as number of acres, number of paddocks, and forage yield. Forage yield can be expressed in pounds per acre per inch. For most pastures, you can expect a yield in the range of 150 to 350 pounds per acre per inch, depending on forage density. Your local NRCS office will likely have data on forage yields for your area.

Knowing the forage requirements of grazing livestock is necessary for successful grazing planning. This is basically the number of animals you are grazing times their average weight times their daily utilization rate. Daily utilization rate is the animal's forage dry matter intake expressed as a percent of the animal's body weight. Beef cattle consume 2 to 3 percent of their body weight per day, whereas dairy cattle consume 2.5 to 4.5 percent of their body weight per day.

Rest periods for various grasses and legumes are important for grazing planning. Rest periods for cool season grasses and legumes is approximately 15 to 30 days, depending on the season. For warm season grasses, the rest period is 20 to 40 days, again depending on the season. Rest periods are important for calculating the size and number of paddocks.

These factors, as well as other planning factors such as paddock layout, size, and numbers, and how many animals a paddock will support, are addressed in the Minnesota Extension publication *Grazing Systems Planning Guide,* and is available online at *www.extension.umn.edu/distribution/livestocksystems/DI7606.html* or by calling 800-876-8636. In addition, the NRCS Grazing Lands team has many online tools and publications to assist producers in documenting a grazing plan. The NRCS Grazing Lands website is *www.glti.nrcs.usda.gov*.

As with any agricultural enterprise, an analysis of the economics of the operation is crucial in the planning process. A budget for a grazing operation should take into account the capital improvements as well as the yearly inputs to operate the enterprise. The ATTRA publication *Grazing Contracts for Livestock* includes budget spreadsheets that are useful for budgeting costs associated with a grazing operation.

Culling animals that don't adapt is essential to achieving a profitable grass-based livestock system.

Information Resources

A host of published and electronic information about rotational grazing is available to producers.

The Stockman Grass Farmer (SGF) is an excellent monthly publication for news about alternative forages and innovative management strategies, as well as for discussions among practitioners of management-intensive grazing. In addition, the commercial and classified ads offer many services, including grazing workshops and supplies that may be difficult to obtain locally. Suppliers and their salespeople often serve as consultants, having practical experience of many grazing operations. A free sample issue of *SGF* is available to those who call or write to request it.

Graze is another outstanding monthly publication that includes articles on all aspects of grazing, pasture management, and marketing. In a regular feature, five or more "grazing advisors" answer a question posed by the editor. These advisors, each an active grazing operation manager, represent a variety of livestock types and geographical locations.

A list of books on grazing is provided at the end of this publication. If local libraries and bookstores are unable to get them, any issue of *The Stockman Grass Farmer* has an ordering form for many of them.

Holistic Management™ (www.holisticmanagement.org) is a decision-making process initially used for livestock management on range. Now the model is being used by many farmers and ranchers to evaluate options as they plan for changes to their operations. Holistic Management International can refer producers to state organizations and regional representatives, who can in turn provide information and contacts with practitioners. After initial training courses, Holistic Management practitioners often form management clubs to further their understanding and learning as they apply holistic management principles. See the ATTRA publication *Holistic Management: A Whole-Farm Decision Making Framework.*

Many land-grant universities have materials about rotational grazing that are specific to their states. Workshops and videos on Management-intensive Grazing may be available as well. Check with local Extension offices regarding such resources.

The Natural Resources Conservation Service (NRCS) has grazing specialists in each state to help farmers improve their grazing management. Your county NRCS office can refer you to the grazing specialist in your area.

Rotational grazing systems provide producers with the ability to match available forage to daily livestock forage demand, resulting in increased productivity and the maintenance of resilient pastures. Photo courtesy USDA-NRCS.

Grazing Lands Conservation Initiative (GLCI) has a website that lists State GLCI Coordinators and Grazing Lands Personnel, available at *www.glci.org/StateGLCI.htm.* The site includes a map and list of designated GLCI grazing specialists for each state.

There are many agricultural discussion groups on the Internet covering a wide range of topics. Internet discussion groups operate via e-mail. Listserves receive and distribute postings. When you subscribe, your name gets added to the mailing list. If you wish to post to the discussion group, you only need to send one e-mail, and the listserve will send it to all members. Subscribing to newsgroups is a simple and painless process, and it is free. There are lists associated with most ruminant breeds. A search engine such as Yahoo! can help locate lists on the Web.

Conclusion

Management-intensive Grazing is not for every producer. It will not instantly provide wealth and leisure or solve all the problems livestock producers face. Some experienced graziers say it takes three years of observation and manipulation of soil, plant, and animal resources to really begin to manage them well. During these years there will be countless challenges and necessary adjustments. Every attempt to prepare for potential problems will make the transition smoother. An assumption that the system can continually be improved will help the manager to identify weak areas early. Being alert for difficulties ensures that they can be addressed before they become serious.

Nevertheless, those producers who have made the change to MiG report many benefits, including increased net income and improved quality of life. In groups of these innovative graziers, one is struck by the enthusiasm and creativity they bring to the management of their particular pasture systems. They observe the results of their decisions and are constantly fine-tuning their systems to meet their production and family goals.

Acknowledgment:

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Resources

Grazing Books

Try searching for these books at online bookstores, libraries, or from the websites listed.

Ball, Donald M., Carl S. Hoveland, and Garry D. Lacefield. 2007. Southern Forages, 4th Ed. International Plant Nutrition Institute , Norcross, GA. 332 p. Available for $35 from:

International Plant Nutrition Institute
Suite 110
655 Engineering Drive
Norcross GA 30092
(770) 447-0335
http://ppi-store.stores.yahoo.net/soutfor.html

Barnes, Robert F., Darrell A. Miller, and C. Jerry Nelson (eds.). 2007. Forages: An Introduction to Grassland Agriculture. 6th ed. Vols. 1. and 2. Iowa State University Press, Ames, IA.

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Savory, Allan, with Jody Butterfield. 1999. Holistic Management: A New Framework for Decision Making. Island Press, Covelo, CA. 616 p. *http://holisticmanagement.org/store//page1.html*

Periodicals with a Grazing Focus

The Forage Leader
American Forage and Grassland Council
350 Poplar Avenue
Elmhurst, IL 60126
800-944-2342
630-359-4274 FAX
www.afgc.org
info@afgc.org
A membership benefit; membership cost $30/yr.

Graze
P.O. Box 48
Belleville, WI 53508
608-455-3311
www.grazeonline.com
graze@grazeonline.com
$30 for 1-year subscription

Hay & Forage Grower
7900 International Drive, Suite 300
Minneapolis, MN 55425
952-851-9329
952-851-4601 FAX
http://hayandforage.com
hfg@penton.com

The Stockman Grass Farmer
P.O. Box 2300
Ridgeland, MS 39158-9911
800-748-9808 (toll-free)
601-853-8087 FAX
http://stockmangrassfarmer.net
sgf@stockmangrassfarmer.com
$32/yr

Holistic Management In Practice
The Savory Center
1010 Tijeras Ave. NW
Albuquerque, NM 87102
505-842-5252
www.holisticmanagement.org
hmi@holisticmanagement.org
free newsletter

Web-Based Publications on Fencing and Water Systems from USDA-NRCS

Electric Fencing for Serious Graziers. Columbia, MO: Missouri Natural Resources Conservation Service. 2005.
www.mo.nrcs.usda.gov/news/pubs_download/out/MO%20NRCS%20Electric%20Fencing_low.pdf

Watering Systems for Serious Graziers. Columbia, MO: Missouri Natural Resources Conservation Service. 2006.
www.mo.nrcs.usda.gov/news/pubs_download/out/Watering%20Systemslow.pdf

Selected Web Resources on Grazing, Forages, and Pasture Management

Many resources are now available on the Internet. Several excellent resources that are applicable to most regions of the US are listed below. Also, be sure to check the websites of nearby land-grant universities. They often contain information useful to both the beginner and the experienced grazier. Note that these addresses change often.

Ranch Management Consultants, Inc.
953 Linden Ave, Fairfield, CA 94533
707-429-2292
www.ranchmanagement.com/index.html
Provides high-quality education and support programs such as the Ranching For Profit School and Executive Link programs, which provide the knowledge and support farmers and ranchers need to improve their land, their lives, and their bottom line.

Tom Trantham's Twelve Aprils Grazing Program
www.southernsare.uga.edu/twelve/trantham.html
Tom Trantham's Twelve Aprils grazing program has been part of three Southern Region SARE projects. Tom has influenced scores of experienced and beginning dairy farmers through presentations at conferences and magazine stories. This on-line manual addresses the most common questions about his system.

Pastures for Profit: A Guide to Rotational Grazing, by Dan Undersander, Beth Albert, Dennis Cosgrove, Dennis Johnson, and Paul Peterson. Cooperative Extension Publishing, University of Wisconsin-Extension. 2002.
http://learningstore.uwex.edu/pdf/A3529.pdf

Grazing Systems Planning Guide
www.extension.umn.edu/distribution/livestocksystems/DI7606.html
A step-by-step guide to planning a grazing system, including inventory of resources, goal setting, designing fencing and water systems, forage requirements, and grazing system monitoring.

Extending Grazing and Reducing Stored Feed Needs, by Don Ball, Ed Ballard, Mark Kennedy, Garry Lacefield, and Dan Undersander. Grazing Lands Conservation Initiative Publication. 2008.
www.agry.purdue.edu/Ext/forages/pdf/ExtendingGrazing-Auburn.pdf

Rangeland Health and Planned Grazing Field Guide by Nathan Sayre and Kirk Gadzia. A Joint Publication from Earth Works Institute, The Quivira Coalition and the Rio Puerco Management Committee. Fourth Edition - April 2009
http://quiviracoalition.org/images/pdfs/77-Planned_Grazing_Field_Guide.pdf

Rangelands West
http://rangelandswest.org
Provides access to many sources of information on rangeland management, including the Extension sites of the western land-grant universities.

American Forage and Grassland Council
www.afgc.org
Offers membership, conferences, and publications.

Notes

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This publication is available on the Web at:
www.attra.ncat.org/attra-pub/rotgraze.html
or
www.attra.ncat.org/attra-pub/PDF/rotgraze.pdf

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