2010 Farm Walk Program
Education for Farmers by Farmers

Lazy R Ranch Farm Walk
May 24, 2010

Presented by
Tilth Producers of Washington and
WSU Small Farms Program

www.tilthproducers.org
http://smallfarms.wsu.edu
Monday April 26 – Black Sheep Creamery, Chehalis, Sheep Dairy, Farm Emergency Plans and Agencies - 12:30pm-4pm, www.blacksheepcreamery.com, Paid pre-registration required

Monday, May 10th – Hedlin Family Farm, La Conner, Row Crop Production, High Tunnel and Greenhouse Cropping, Succession Planning - 12:30pm-4pm, www.sustainablenorthwest.org/stories/hedlin-family-farm


Monday, June 7 – Tonnemaker Hill Farm, Royal City, Orchard Diversification and Organic Transition, Fresh Market Vegetables - 12:30pm-4pm, http://tonnemaker.com

Wednesday, June 16 – WSU Field Day and Organic Farm, Pullman  Wheat Variety Trials & Organic Diversified CSA Farm - 9am-3pm, www.css.wsu.edu/organicfarm, farm Walk is free, pre-registration required for lunch

Monday, July 26 – WSU Field Day and Organic Farm, Puyallup, On-Farm Mock GAP Certification Process - 12:30pm - 4pm, www.puyallup.wsu.edu/soilmgmt

Monday, September 6 – Manuel Mendoza Orchard, Quincy, Apple and Cherry Orchard, Latino Landowner Challenges and Opportunities - 12:30-4:00pm, http://www.tilthproducers.org/ManuelMendozaOrchard.pdf

Monday, September 27 – Filaree Farm, Omak, Biodiversity, Cooperative Marketing Model, Seed Saving - 12:30pm-4pm, www.filareefarm.com

Monday, October 11 – Boistfort Valley Farm, Curtis, Low Input Season Extension, Organic Row Crop Production - 12:30pm-4pm, www.boistfortvalleyfarm.com, paid pre-registration required

Thursday, November 11 – Pre-Conference Farm Walk – Stay tuned for details.
Tilth Producers Annual Conference, Fort Worden, Port Townsend, November 12-14, 2010
FARMER-TO-FARMER: PASSING ON THE WISDOM
2010 Farm Walk Education Series

Sponsored by the WSU Small Farms Team (smallfarms.wsu.edu)
and Tilth Producers of Washington (www.tilthproducers.org)

THE LAZY R RANCH
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Farm Walk Evaluation Form...
Please fill out and leave at the site
THANK YOU!!!
Family History

Grandpa Earl moved to our ranch in the fall of 1937. He had 20 milk cows, two strong sons and a daughter. His son Gene converted from milk cows to beef in 1950, the year before his son Maurice was born. We have been raising beef since then.

In 1996, we adopted the principles of holistic management. Oldest daughter, Beth, is helping with marketing and grazing today. None of this would have been possible without the help and support of the many strong women who have helped work the ranch, including Earl’s wife Louella, a professional chef, Gene’s wife, Lorene, a school teacher, and Maurice’s wife, Ellen.

Meet Our Family

Maurice
Maurice knew he wanted to raise cattle from a very early age. In fact, his first word was “Moo.” He earned his masters in sociology from the University of Idaho, then moved to Montana where he met his wife, Ellen. In 1981 they moved back to Cheney to resume ranching.

Ellen
Ellen, Maurice’s wife, is the backbone of the family. Originally from Butte, Montana, she has helped with every aspect of the ranch, from working cattle to keeping track of the books.

Beth
Beth is the oldest Robinette daughter. She attends WWU where she is pursuing a self-designed degree entitled “Empowering Family Farms: Profiting from Sustainability.” She plans to one day come back home to help her dad with the ranch.

Jacqueline
Jacqueline is the younger daughter of Maurice and Ellen. She is currently attending University of Puget Sound where she plans to study international relations.
Lazy R Ranch, Maurice Robinette

I am a third generation rancher from southwest Spokane County. We produce grass-finished beef using the principles of holistic management and planned grazing. Planned grazing allows a producer to put animals at the right place at the right time for the right reasons. I have been a certified educator of holistic management since 1998 and have used the principles since 1996.

I recently was the eastern organizer for the Washington Sustainable Food and Farming Network and last year we completed our second year of Beef Up the Palouse, an Ag Pilots Project. This project looked at the economic feasibility of grazing Conservation Reserve Program (CRP) land in the Palouse. We used planned grazing to produce income equivalent to CRP contracts and proved that grazing is an economically feasible alternative to CRP.

I have two daughters in college and a wife nearing retirement at UPS. I am a founding director of Managing Change Northwest, a group of educators and consultants providing services centered in holistic management, including eco-system monitoring, financial planning, land planning and planned grazing.

Production Practices

Until 1996, we were very conventional in our ranching practices. Since then we have adopted the principles of Holistic Management, and Maurice has even been certified as an educator for HM. In order to make holistic decisions, we look at all aspects of the ranching process: animal, producer, and client. We have established clear goals regarding our quality of life, ideal product, and how we want the world to be in the future. All of our important decisions are tested against these ideals and goals in order to give us the best possible results.

We try to match the nutritional requirements of the animal to the forage availability of the land. This means calving in late spring and early summer. We graze with high animal densities, up to 100 pair per
Acre in some instances. Animals are moved frequently with little to no stress, resulting in contented cows. When we butcher, it is done as humanely as possible.

At the Lazy R, we place a heavy emphasis on biodiversity and try our best to preserve wildlife habitat through our practices.

**Why Grassfed?**

**It’s good for you!**
Meat, eggs, and dairy products from grass-pastured animals are ideal for your health. Compared with commercial products, they offer you more "good" fats, and fewer "bad" fats. They are richer in antioxidants; including vitamins E, beta-carotene, and vitamin C. Furthermore, they do not contain traces of added hormones, antibiotics or other drugs. Because meat from grass-fed animals is lower in fat than meat from grain-fed animals, it is also lower in calories.

**It’s good for the environment!**
When properly done, using a process called planned grazing, we put animals at the right place, at the right time, for the right reasons, mimicking natural processes. This process can be very complex, but we have been doing it for over twelve years and it is becoming very natural.

**It’s good for the animal!**
Cattle are highly specialized animals who have evolved to eat grass. Feeding cattle grain changes their body chemistry, making them very sick. It also leads to nastier bacteria moving into the stomach, such as the form of E. coli that is deadly to humans. Grain for cattle is like a candy bar for a human. If you ate mostly candy bars, you wouldn’t be very healthy! That’s why our cattle are never given any grain. They eat off of the lush grasses in a carefully managed pattern to maximize nutrition and ecological benefit.

**It’s good for the rancher!**
Direct marketing cuts out almost all of the middlemen and optimizes the profits and minimizes the costs. These economic efficiencies are shared by both the consumer/purchaser and the producer/rancher. Buying locally is the best way to ensure food security. You know how your food is raised and who is doing it. If you have a problem with our product, we guarantee we will fix it. We’ve only had to do this twice in 30 years of selling beef.

**What is Holistic Management?**

Holistic Management Institute provides, promotes and teaches holistic land management, which works in concert with natural processes. Holistic Management has been proven effective in restoring damaged grasslands to health and sustainability, and at increasing the productivity and profitability of ranches and farms. HMI facilitates scientific research on grasslands from around the world, offering both a clearinghouse and contact point for others involved in the urgent battle to save earth’s grasslands.

Our primary objective is to help farmers and ranchers, as well as public land managers and development organizations, to achieve these and other critical goals:

- Enhance the efficiency, natural health, productivity and profitability of their land;
- Increase annual profits, effectively and significantly;
• Provide a framework for family, owners, managers, foremen, communal agriculturalists and other ranch / farm stakeholders to work together toward a common future;
• Enable conservation or public land managers to consistently improve the health of the land while minimizing the cost to the public or constituencies;
• Enable development agencies working with marginalized farmers or pastoral people to break the cycle of food and water insecurity.

We are responsible for, and committed to, the economic viability of our enterprise. Philanthropic support accounts for approximately one third of our operating and program costs. In addition to receiving donations and other funding, we offer consulting services and training in land management, as well as a variety of revenue generating educational tools.

Finally, we are committed to furthering Holistic Management education worldwide, to supporting trained Holistic Management professionals, and to forming strategic partnerships that address a wide range of environmental, social and economic objectives. Working for a sustainable future since 1984.
Pesticide Disclaimer

Documents included in this packet may contain information regarding pesticides used in states other than Washington. It is the responsibility of the reader to determine whether those active ingredients or pesticide products are registered for use in Washington State.

Readers are reminded that all pesticide products, including products certified for use in organic production systems, must be registered by the Washington State Department of Agriculture's Pesticide Division in order to be legal.
Ag Pilots Project
Beefing Up the Palouse-An Alternative to the Conservation Reserve Program (CRP)
Final Report Summary

Participants
Donald D. Nelson, Gregg Beckley, Maurice Robinette, Dick Coon, Shannon Neibergs, Steve Van Vleet, Lynne Carpenter-Boggs, Joel Huesby, Anne Schwartz, Tom Lamar, Trudy Bialic

Overview of project
The Beefing Up the Palouse (BUP) pilot project is exploring strategies for converting land coming out of the Conservation Reserve Program (CRP) to a holistically managed forage resource using planned cattle grazing as the principle tool to move towards sustainability. Sustainability is defined as those practices that are economically viable, environmentally sound and socially responsible.

As of 2007, the state of Washington had 1,557,212 acres enrolled in the CRP. The site of this project is located on G & L Farms in Adams County near Benge, Washington. This 6,000-acre farm includes 5,000 acres that are currently enrolled in the CRP. Adams County has one of the largest CRP enrollments nationwide, at over 214,000 acres, and a significant portion of this acreage is nearing the contract end in the next two years (2010-2011). USDA efforts to scale back total enrolled CRP acreage while focusing new offers on smaller contracts through Environmental Priority practices, as required by the 2008 Farm Bill, will likely lead to a significantly reduced CRP presence in Adams County and throughout central Washington as early as 2010.

What is going to happen to the 39 million acres of land currently enrolled in the CRP in the U.S., including the 1.5 million acres in the state of Washington when the contracts expire? Sustainable alternatives to prevent these lands from returning to conventional tillage programs (e.g., winter wheat/fallow in Adams County) need to be characterized and replicated. To be viable these alternatives should be able to produce revenue equal to, or greater than the CRP contract payments (i.e., $50-55 per acre) while concurrently enhancing ecosystem processes and services.

Due to contract restrictions and payment reductions, no land enrolled in the CRP program was grazed in this study. Land adjacent to lands in the CRP with similar topography and soil type and planted to grass/legume pasture was used to duplicate the effects of grazing and recovery periods. Some CRP land was used to test different fertilizer effects and alfalfa inter-seeding techniques. The 1,000-acres of non-CRP land (500 acres of which are in grass/legume pasture) plus another 300+ acres of land in the CRP were Certified Organic in May 2008.

How the project has met, or has not met, each of the goals outlined at the beginning of the Ag Pilots funding?

Goal #1: Assess the economic feasibility of CRP conversion to a grass-fed natural or organic beef production system.
During the 2008-grazing season (April-July) we grazed 112 head of 2-year old cattle that were being grass-finished for Joel Huesby (Thundering Hooves, Touchet, WA), a natural pasture-finished beef producer, plus 84 head of yearling steers owned by Mike Para (Para Cattle Co., Othello, WA) on a $.34/lb. gain basis. During the 2009 grazing season (April-July), we grazed 304 head of yearling steers for Mike Para on a contract $.34/lb. gain basis.

We were unable to get a research exemption to graze CRP without payment reduction from Adams County Farm Services Agency.


An economic model to evaluate forage availability relative to cow nutrition needs and altering the start of the calving season is currently being programmed. This model will use forage and economic information generated by this Ag. Pilots Project. The model contributes to the economic feasibility goal, by examining differing production management strategies to best utilize the project area’s resources and to provide an analysis tool to evaluate an operation’s unique resource structure. The model is a component of the overall feasibility analysis of utilizing CRP lands as a forage resource. Although this model and report will not be completed by this project’s termination date, we look forward to completing the analysis in late Fall 2009 and crediting the Ag. Pilots Project for support. (Shannon Neibergs)

**Goal #2:** Assess and demonstrate agronomic strategies, including inter-seeding alfalfa for enhancing degraded CRP grass stands into productive pasture in the 12-14 inch rainfall areas of Washington State. (Steve Van Vleet)

Vegetation goals: Evaluate the establishment of legumes into a monoculture of established CRP grass stands. Another goal was to determine the best varieties (grass and legumes) to plant in a 12-14 inch rainfall ecosystem and the establishment potential of the forage species in a CRP system when transitioning from a decadent CRP monoculture of grass to a grass-fed beef forage based system. For results refer to discussion and Tables I and II on pages 12-14.

**Goal #3:** Monitor the biological effects of planned grazing using the Land EKG rangeland monitoring system. (Maurice Robinette)

Four permanent Land EKG monitoring transects sites have been established. All of them were read before and after grazing during year one. Three of these transects were read before grazing in year-2 and the fourth one was read after one grazing in year two. The intent is to do one more post-grazing reading on all four sites in 2009 (cattle were shipped off of G & L Farms on July 23). No comparisons had been made to determine grazing impacts due to the small amount of data collected in just two years (i.e., comparative at the same site). If the AFRI Managed Ecosystems proposal is funded, we will be able to collect additional data for four more years. It appears that there was nearly complete re-
growth at every site post-grazing. The pre-graze readings probably occurred before maximum growth had occurred.

**Goal #4:** Assess the replicability of this project by describing the place-dependent factors likely to affect feasibility by mapping these factors utilizing known parameters, as well as Geographic Information Systems (GIS). (Lynne Carpenter-Boggs)

The map below shows the estimated potential productivity across the Palouse River watershed based on NRCS data. These estimates take into account soil texture, pH, organic matter, depth to bedrock, and precipitation. The location of G & L Farms is indicated, and like 40% of the Palouse it is estimated to support 1-2 Animal Unit Months (AUMs) per acre. Toward the center 30% of the Palouse precipitation increases and grazing potential greatly improves to 2.1-5.1 AUMs, largely depending on very localized soil conditions, slopes, and aspect. In portions of this area too, pasture improvement has been considered more worthwhile. On the eastern 30% there is potential for up to 5.5 AUMs according to NRCS assumptions.

This map is based on soil and precipitation (natural resource supplies and limitations), and does not take into account other significant limitations of water for cattle and knowledge. As for water, at G & L Farms several existing wells are accessible and water development to allow grazing was relatively minor. In locations where wells and/or ponds or other major structures are needed, this will dramatically increase base infrastructure development costs in order to take advantage of the grazing potential.

In the first year of Beefing Up the Palouse project, 1.7 AUMs were supported as well as some harvested hay that provided the landowner income similar to the CRP payment. It also supported a part-time cattle manager. In the second year, production increased to approximately 2.5 AUMs largely due to more intensive grazing management. This is 75% more than the average 1.5 AUMs estimated by NRCS, made possible by pasture improvement and planned grazing. Producers considering replicating this production shift should be strongly encouraged to improve the plant biomass and protein production through seeding and fertilization prior to intensive grazing for profit. Knowledge of or access to skills in intensive planned grazing was a significant factor in the success and profitability of this project. Expanded education in planned grazing will be necessary to support mass replication of the success seen at G & L Farms.

Payments for CRP contracts are approximately $50-$80 per acre per year across the Palouse, being higher in the eastern high rainfall zone. The lower payment common near Benge was replaced even in the first year of the Beefing Up the Palouse, and increased in year 2. The far greater (3-4 times) potential productivity (or even more with intensive planned grazing) in the eastern Palouse could provide returns greater than the current CRP payment.

In summary, this agricultural model is definitely replicable in the Palouse. Availability of water and knowledge/skill in planned grazing will determine the profit level, but the potential is good to provide returns greater than the current CRP payment rate.
Goal #5: Demonstrate that fundamental underlying principles and pilot results can be applied in different environments and situations using adaptive management.

The May 19-20 conference, How to Survive and Be Profitable in the Beef Business-Planned Grazing and Grass-fed Beef Production, brought together 64 cow-calf and grass fed producers and presenters from Washington, Idaho, Oregon, Montana, Colorado and Nebraska. Each producer represented a unique resource base. The project’s principles and management recommendations had applications to each producer. Responses on the conference evaluation questionnaire indicated a range of actionable items they were going to evaluate or implement. Evaluating a ranch’s carrying capacity, implementing planned grazing and cow breed and frame size were commonly identified as management issues the producers were going to evaluate. Monitoring ecosystem processes and quantifying forage production was another item that was identified as a management priority.
**Project successes and challenges**

**Infrastructure:**
One challenge this project faced was the lack of fencing, corrals, loading facilities and water delivery infrastructure. Over the years, as farms became more specialized and no longer raised livestock, the fences were removed to facilitate farming practices. Fencing and water distribution systems are expensive to construct and maintain and need to be amortized over a number of years. Today, one of the most cost effective fencing methods is the use of high tensile electric fences (both permanent and temporary) and battery or solar powered energizers. High stock density grazing requires the availability of larger volumes of water than conventional low stock density systems. A combination of buried and aboveground pipe, pumping systems, portable water storage tanks and truck mounted water tanks were used in this project. A multi-year agreement between the landowner and the cattle grazier to accomplish infrastructure development has been developed.

**Research exemption to graze CRP:**
Another challenge we encountered was several unsuccessful attempts to obtain a research exemption from the Farm Service Agency to graze land currently under CRP contract without incurring the 25% payment reduction and to not be restricted by the prohibition of grazing during the primary bird nesting period from April to August.

An additional challenge to-date has been the lack of success using a variety of methods to inter-seed forbs and legumes in existing CRP stands. This was constrained by regulations that prevented the project from directly grazing CRP stands. The hypothesis is to graze the CRP stand to remove forage growth and to use the cattle’s hoof action to break up the existing thatch and then broadcast a desired seed mix and use intensive grazing to incorporate the seed into the soil layer. This grazing strategy may be the most sustainable and successful method to establish a more desirable forage mix into existing CRP stands. However, we could not test this because of CRP grazing restrictions that were beyond the project's control.

**Land EKG Monitoring:**
Had some problems getting all of the rangeland monitoring data together, mostly because of the volume of data and the amount of it and how dispersed over time the monitoring activities were. Need a better system of keeping everything together. Better use of the Land EKG Datastore website and prompt data entry in the future will help alleviate this problem.

**Where is the project heading?**
Properly evaluating ecosystem changes in long-term programs such as transitioning CRP land to a grass-fed beef system takes multiple years of research analysis to yield reliable results. Nevertheless, through this project we have strengthened partnerships between agencies and groups with differing viewpoints, were able to see the economic benefits of converting to a grass-fed beef based system instead of a government based subsidy program, and identified some of the environmental benefits of this system compared to a fallow/wheat farm-based system.

This project has produced additional unanswered questions such as: What is the impact of different grazing strategies on the ecosystem processes and the associated ecosystem services?
What is the magnitude of these impacts? How long does it take for these impacts to appear? More specifically, what is the impact on carbon sequestration? What are the effects of these impacts on productivity (i.e., biomass production and cattle gains)? We want to continue and expand this project to get answers to these questions. To this end, the Ag Pilots Team identified the USDA/CSREES Agriculture and Food Research Initiative’s (AFRI) Managed Ecosystem program as a potential source of funding.

**Synopsis of results of the pilot study/project:**

**Results from 2008 Grazing Season** (Dick Coon)

Number of cattle grazed:
- Huesby: 112 hd.- avg. in-wt. 907 lbs. (charged @$0.40/lb. gain)
- Para: 84 hd.- avg. in-wt. 593 lbs. (charged @$0.34/lb. gain)
- Total 196 hd.- avg. in-wt. 778 lbs.

Acres grazed: 393
Acres hayed: 107
Total acres: 500
Grazing period: April 19 through July 29, 2008 (102 days)
Average daily gain: 2.42 lbs./hd./day
Total gain: 42,062 lbs.
Revenue from gain: $15,885.64
Value of hay harvested: $3,159.00
Total gross revenue: $19,044.64
Gross revenue/acre: $48.46

**Results from 2009 Grazing Season** (Dick Coon)

Number of steers delivered: 304 hd.
Average in-weight: 681 lbs./hd.
Grazing period: April 13 to July 23, 2009 (101 days)
Death loss: 10 hd. (8-alfalfa bloat, 1-buller and 1-bovine respiratory disease)
Total gain: 61,097 lbs.
Charge/lb. gain: $.34
Average daily gain: 2.33 lbs./hd./day
Acres grazed: 500
Total gross revenue: $20,772.98
Gross revenue/acre: $41.55
Less ½ cost of Bloatguard blocks: $1,793.22
Total net revenue: $18,979.76
Net revenue/acre: $37.96

Note: Management suggestions regarding future bloat prevention in paddocks that contain a high percentage of alfalfa (50%+): (1) do not graze until alfalfa is over 10% bloom, (2) use of Bloatguard blocks, or (3) swath and wilt alfalfa before grazing.
Land EKG™: Ecosystem Service Monitoring for Range Managers

Abstract
The 3-day Land EKG Rangeland Monitoring Workshop is designed for participants who seriously want to learn and apply the rangeland monitoring system. It will be conducted on a Washington ranch and the field forms will by tailored to match native soils, plants, climate and issues of local area. The objective of the workshop is to provide the necessary background and hands-on skills to establish and evaluate rangeland sites and perform the Land EKG documentation process. Further exercises teach how monitoring information directs management to make sustainable and profitable decisions.

Introduction
The Land EKG™ monitoring system is a comprehensive land-monitoring method. Instructors work with land owners/managers who want to improve their land’s natural resources to sustain future generations for production, recreation, and wildlife habitat. Land EKG™ monitoring does this by documenting and tracking ecological health, which leads land owners/managers towards better grazing and habitat management decisions.

Why?
Landowners are under growing scrutiny by the public to manage conservation easements, watersheds, and rangelands in an environmentally friendly manner. Land EKG™ rangeland monitoring can determine what areas of a property are functioning at a healthy state, and which have concerns. Immediate data results enhance management’s efficiency and will provide a benchmark towards addressing the “what’s next” question. Through good management goals, planning, and monitoring, range areas can be improved or sustained to increase habitat for wildlife and/or livestock by creating healthy soil systems with diverse plant and animal communities.

Impacts
Short-term (knowledge gained and shared): Participants learned a common method of monitoring and documenting ecological status and trends on a given site. This created a mutual recognition by participants that planned cattle grazing can be used as a tool to improve rangeland and enhance wildlife habitat by improving the effectiveness of the ecosystem processes (i.e., water cycle, mineral cycle, solar energy flow and community dynamics/succession). In addition, joint training of ranchers and agency personnel strengthens relationships and builds a common vocabulary that results in more effective communication.

Intermediate (current and expected change in behaviors): Participants were encouraged to implement the Land EKG techniques on the land that they own or manage and to assist others by establishing transects and fixed photo-points to document changes that are taking place on the ground. Participation by ranchers and agency personnel provides tangible evidence of a growing interest in sustainable management of natural resources.

Long-term (potential change in economic/environmental situations): Improved rangeland health and wildlife habitat through collaborative efforts between ranchers, land management agencies and environmental organizations that use planned grazing as a tool to create a future landscape description. To illustrate the potential positive impact, participants in a previous Land EKG workshop held on a ranch in the Ellensburg area in 2006 owned and/or managed approximately 1.15 million acres of Washington rangeland.

Cattlemen assessing mineral, water, biotic, and energy characteristics at a range site near Ellensburg, WA.

Participants at the first BIOAg-funded Land EKG™ workshop, from the WA Cattlemen’s Assoc. and WA Dept. Fish & Wildlife

Example of a Land Eco-graph

Don Nelson¹, Maurice Robinette², Charley Orchard², and Lynne Carpenter-Boggs¹

¹Washington State University
²Washington Sustainable Food & Farming Network,
³Land EKG- Bozeman, MT
Abstract: Rotational grazing is periodically moving livestock to fresh paddocks, to allow pastures to regrow. Rotational grazing requires skillful decisions and close monitoring of their 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.

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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 Matching Livestock and Forage Resources in Controlled Grazing 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, usually results over time in a plant community of less-desirable 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 does, however, have the benefit of low capital investment, since few fencing and watering facilities are required. Because livestock are seldom moved from pasture to pasture, management decisions are simple. This type of 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 pastures are overstocked, growth rates 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.

Management-intensive 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 on a given acreage is often possible with the change 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. 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 publications Grass-Based and Seasonal Dairying and 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.)

MIG offers the manager a wide range of options in terms of grazing intensity. The enclosed chapter from Forages, the Science of Grassland Agriculture provides a thorough discussion of various grazing systems. The section “Building Forage-Livestock Systems” deserves special attention.

When making a change in grazing management, a logical first step is an inventory of the farm’s resources. An outline to help in this inventory process is enclosed. Another useful tool is an aerial map of the farm on which 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.

Implementating 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 enclosed materials 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.

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. Purchased feed costs also shrink.

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.

Animals need to be trained to 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.)

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 *Introduction to Paddock Design*.

**FORAGE GROWTH**

How much pasture area to offer animals and how long to keep them there are critical decisions for a successful grazer. 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.

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. Additional information on these management decisions is included in the enclosures.

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. Continuous 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.

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. (2)

<table>
<thead>
<tr>
<th>Profits improve because:</th>
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</thead>
<tbody>
<tr>
<td>1. The stocking rate is higher.</td>
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<tr>
<td>2. The grazing season is longer.</td>
</tr>
<tr>
<td>3. There is less need for land dedicated to “hay production only.”</td>
</tr>
<tr>
<td>4. There is less dependence on mechanical equipment.</td>
</tr>
<tr>
<td>5. Animal health improves.</td>
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</tbody>
</table>

Keith Johnson, Forage Crops Specialist, Purdue University Cooperative Extension Service
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.

Other than salt, the need for mineral supplements is likewise difficult to determine. If soil tests show 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. *Sustainable Pasture Management*, a companion ATTRA publication, provides 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. 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.

INFORMATION RESOURCES

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

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.

The Stockman Grass Farmer (SGF) (4) 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.

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™ 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. The Center for Holistic Management (5) 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.

There are many agricultural discussion groups on the Internet covering a wide range of topics. Internet discussion groups operate via e-mail. Listservers 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 listserver 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 (see Table 1). A search engine such as Yahoo! can help locate other 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

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**Table 1. Internet Listservers**

<table>
<thead>
<tr>
<th>Listservers are electronic discussion groups that often include experienced producers, researchers, and educators. They are a rich resource, but since they are rarely moderated, evaluate the information carefully.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grazing Lists</strong></td>
</tr>
<tr>
<td>Graze-l discusses intensive rotational grazing and seasonal grazing. This newsgroup is based in New Zealand and has a definite international feel to it.</td>
</tr>
<tr>
<td>To subscribe send an e-mail to <a href="mailto:listserv@taranaki.ac.nz">listserv@taranaki.ac.nz</a>. In the body of the e-mail type “subscribe graze-l.”</td>
</tr>
<tr>
<td>Graze-l also has a Web page with an archive of past discussions: <a href="http://grazel.taranaki.ac.nz/">http://grazel.taranaki.ac.nz/</a>.</td>
</tr>
<tr>
<td>The Grazer’s Edge is another on-line forum. To subscribe to the grazersedge listserve, send e-mail to <a href="mailto:grazersedge-subscribe@egroups.com">grazersedge-subscribe@egroups.com</a>.</td>
</tr>
<tr>
<td><strong>Sheep</strong></td>
</tr>
<tr>
<td>There is a list for sheep called SHEEP-L.</td>
</tr>
<tr>
<td>To subscribe to SHEEP-L, send the message “subscribe SHEEP-L Your Name” to <a href="mailto:listserv@listserv.uu.se">listserv@listserv.uu.se</a>. Post e-mail messages at <a href="mailto:sheepl@listserv.uu.se">sheepl@listserv.uu.se</a>.</td>
</tr>
<tr>
<td><strong>Goats</strong></td>
</tr>
<tr>
<td>Subscription address: <a href="mailto:Listproc@listproc.wsu.edu">Listproc@listproc.wsu.edu</a>. In subject line and message area type “subscribe goats-Your Name.”</td>
</tr>
<tr>
<td><strong>Dairy</strong></td>
</tr>
<tr>
<td>Dairy-L@umdd discusses a wide range of dairy issues. Topics tend to revolve mainly around the feeding and health of dairy cows. Discussions are based around the American / Canadian confinement system.</td>
</tr>
<tr>
<td>To subscribe send an e-mail to <a href="mailto:listserve@umdd.umd.edu">listserve@umdd.umd.edu</a>. In the body of the message type “SUB Dairy-L Your Name.”</td>
</tr>
</tbody>
</table>
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.

REFERENCES


4) The Stockman Grass Farmer P.O. Box 9607 Jackson, MS 39286-9607 800-748-9808 (toll-free) http://stockmangrassfarmer.com/sgf/

5) Center for Holistic Management The Savory Center 1010 Tijeras, NW Albuquerque, NM 87102 505-842-5252 800-654-3619 (toll-free) www.holisticmanagement.org/

ENCLOSURES


Mundy, Victoria. 1995. Successful grazing systems start with solid goals. NSAS Newsletter. No. 52. p. 4-5.

Stockman Grassfarmer Bookshelf. 4 p.

GRAZING BOOKS


The following grazing books are available from the Stockman Grass Farmer’s Bookshelf. A copy of the order form and brief descriptions of the books are included in the enclosures, or you can visit the electronic version at http://stockmangrassfarmer.com/sgf/bookshelf.html.


**PERIODICALS WITH A GRAZING FOCUS**

The Forage Leader
American Forage and Grassland Council
P.O. Box 94
Georgetown, TX 78627
800-944-2342
[www.afgc.org](http://www.afgc.org)
A membership benefit; membership cost $30/yr.

Graze
P.O. Box 48
Belleville, WI 53508
[www.grazeonline.com](http://www.grazeonline.com)
$30 for 1 year subscription

Hay & Forage Grower
2104 Harvell Circle
Bellevue, NE 68005
866-505-7173 (toll-free)
$12/yr.

The Stockman Grass Farmer
P.O. Box 9607
Jackson, MS 39286-9607
800-748-9808 (toll-free)
$32/yr.

**WEB RESOURCES**

Many resources are now available on the Internet. Besides listservers, mentioned in the box above, there are many useful Web sites. Several are listed below. Also, be sure to check the Web sites of nearby land-grant universities. They often contain information useful to both the beginner and the experienced grazier. Note that these addresses change often.

**The Great Lakes Grazing Network**
[www.glgn.org/](http://www.glgn.org/)
Best all-around site for grazing information; provides access to grazing and forage information for the states surrounding the Great Lakes; quality links.

**Cornell Forage-Livestock System**
[www.css.cornell.edu/forage/forage.html](http://www.css.cornell.edu/forage/forage.html)
Excellent forage information for northeast states, including a forage selection tool for NY; grazing manual.

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

**American Farmland Trust’s Grassfarmer Site**
Information doorway for grass-based farming, with special emphasis on dairy.

**University of Wisconsin Forage and Extension Links**
[www.uwex.edu/ces/forage/links.htm](http://www.uwex.edu/ces/forage/links.htm)
Extensive research-based information on grazing, including access to other states’ variety trial results; extensive dairy information is included.
Maximizing Fall and Winter Grazing of Beef Cows and Stocker Cattle
http://ohioline.osu.edu/b872/index.html
Besides excellent material on season extension grazing strategies, various harvest methods and supplementation plans are described.

Ohio State Extension
[Copies of this publication can be ordered by calling (614) 292-1607.]

Rotational Grazing
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NCAT Agriculture Specialist
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Formatted by Cynthia Arnold
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The Electronic version of Rotational Grazing is located at:

Forage Systems Research Center
http://aes.missouri.edu/fsrc/
Grazing schools and workshops; publications and research.

Sustainable Farming Connection’s Grazing Page
www.ibiblio.org/farming-connection/grazing/home.htm
Grazing discussion group; practical information on fencing and grazing management; forage resources.

North Dakota State University Grassland Report Index
www.ag.ndsu.nodak.edu/dickinso/grassland/rangrpt.htm
Extensive collection of articles on grazing management in the rangeland environment; soil concerns and forages; livestock nutrition.

University of Minnesota
[Copies of the following two publications can be bought by calling 800-876-8636.]

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.

Knee Deep in Grass—A Survey of Twenty-nine Grazing Operations in Minnesota
www.extension.umn.edu/distribution/livestocksystems/DI6693.html
A survey of grazing dairies that includes information that would be useful to other grazing operations.

State Grazing Lands Conservation Initiative Coordinators and Grazing Lands Personnel
www.glci.org/StateGLCI.htm
Map and list of designated GLCI grazing specialists for each state.
More Pasture and Livestock Resources

Grazing:
Stockman Grass Farmer Monthly: the grazing publication of North America. Since 1947 it has been devoted solely to the art and science of making a profit from grassland agriculture. 1-800-748-9808, www.stockmangrassfarmer.net

Management Intensive Grazing (MIG) Resources:

For the Love of the Land: Global Case Studies of Grazing in Nature’s Image, by Jim Howell

Grazing Listserves (from Rotational Grazing, ATTRA):

Graze-l discusses intensive rotational grazing and seasonal grazing. This newsgroup is based in New Zealand and has a definite international feel to it. To subscribe send an e-mail to listserv@taranaki.ac.nz. In the body of the e-mail type "subscribe graze-l."
Graze-l also has a Web page with an archive of past discussions: http://graze-l.witt.ac.nz/pipermail/graze-l/.

The Grazer's Edge is another on-line forum.
To subscribe to the grazersedge listserve, send e-mail to grazersedge-subscribe@egroups.com.