



Improving Soil and Grass with Cattle

Understand how proper rangeland management can affect your operation long-term.

by Heather Smith Thomas

Modern farming methods sometimes take more from the soil than is added back. Thankfully, in today's agriculture industry, producers have commercial fertilizers to aid in preventing declining productivity in crops and soils. Hayfields tend to lose productivity unless farmers and ranchers add fertility, and the best way is with animal impact to return nutrients to the soil by grazing and by feeding the hay on those fields to add litter and manure. Grazing crop residues improves farmland by adding manure, and properly managed, grazing aids pasture health, often increasing the carrying capacity. Soils, plants and grazing animals have a very beneficial relationship.

A growing number of farmers and ranchers are moving back toward the pretechnology wisdom of our great-grandfathers, using animals to improve the land. Here are a few success stories that help illustrate what can be done to reestablish healthy soils and pastures.

Sims Cattle Co. in Wyoming

Scott and April Sims and their son and his wife ranch holistically near McFadden, Wyo. Sims' grandparents bought the place in 1942. It has always been a cow-calf operation and hay ranch.

"We fertilized the hay meadows and put up lots of hay, and sold hay, and kept building cow numbers," Scott says. "Dad and I started with about 75 cows

and now we are running more than 600 cows."

During the 1980s, the calves were getting heavier, the herd was growing in numbers, and the ranch was growing extra hay to sell.

"Then in the late 1980s my brother and I were riding across a pasture after we'd moved cows out to summer grass. We asked ourselves if we were really being

sustainable. We were doing well, but perhaps at the expense of the land. Riding across the pastures that day, we realized we needed to do something different," Scott recalls. "The grass didn't look healthy. We had larkspur and weeds and thought we should be doing something to correct this."

Sims says that during the late 1970s and early '80s, their family plowed up marginal rangeland

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— Scott Sims

that had been abused by previous owners. It wasn't necessarily an issue of mismanagement because the area had been a large water gap for cattle before there were fences.

"To resolve that, we put crested wheatgrass in that area, which greatly increased forage production on that ground," he explains.

"This gave us an opportunity to go out on grass earlier in the spring. We started using AI



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PHOTO COURTESY OF ART MICELROY



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(artificial insemination) in 1975, so this worked very well – having the crested wheat pasture to utilize while breeding the cows.”

He says that in cooperation with the University of Wyoming and the Soil Conservation Service, they put in a test plot with several varieties of summer grasses to see which ones would do well in the high altitude area. Simultaneously, they noticed they were getting a lot of broom snakeweed in the crested wheat and it was also coming into native range.

Tom Whitson from the University of Wyoming came out and set up test plots to try different chemicals on the broom snakeweed. They were successful in killing it, but within about three years, it came back. In that same time frame, Sims says they decided to do some spraying on the rangeland because it didn't have much grass and also had many invading plants, and they could not understand why these problems existed.

“We learned later that by spraying we were not only killing the broom snakeweed but also killing a lot of forbs that were high in phosphorus,” he says. “We were buying expensive mineral for the cattle, and killing our phosphorus source.”

Another thing they noticed was the heavy cattle use in the AI pastures made a difference.

“The pens we set up for heat detection got used hard, with lots of trampling and manure, and there wasn't much grass left by the time we got done,” Scott says, “but the next year it grew very well.”

In the winter of 1989, Sims and

his brother went to one of Allan Savory's schools. Sims says it was a five-day course packed full of valuable information that took some time to absorb, but they began change immediately.

“We came home and started dividing pastures,” he says. “We realized we were overgrazing and needed to rest the pastures. Before that, it was basically summer-long grazing without much planning. We needed to create some animal impact as well as rest periods, so we started fencing and developing water.”

He says they put the cattle together in bigger groups, moving them through the pastures faster, and began to see some difference. During the grazing school, Sims said, presenters talked about using a pasture and not going back until it had had a chance to recover.

“There was talk about 30 days of rest and recovery, up to 90 or 120 days,” he recalls. “We found that our pastures didn't recover that quickly. All we have is cool season grasses. After you graze that type of pasture, it's not going to recover the same year.”

During that time, Sims says they monitored the land during grazing season and were able to see many changes.

“We started to see plants closer together, more litter on the ground, higher numbers of insect populations. It was exciting,” Sims says.

They applied holistic management to grazing their rangeland, but Sims says they still had their hay meadows that they were fertilizing and from which they were selling hay. Sims says a positive was the way they sold

their hay was the cattle went there to eat it, so the manure stayed there as a nutrient for the soil.

In contrast, Sims says that with commercial fertilizer, they weren't producing as much hay, their profit margin was less due to increased fertilizer cost and they created a monoculture in their pastures.

Since they were no longer fertilizing all the fields, Sims explains they had some meadows they had not fertilized for a few years, and they were starting to see some diversity coming back into those meadows.

“There were a lot more forbs coming in,” he says, “especially alsike clover and red clover. Our production was down but the quality was going up.”

In 2015 they didn't use any fertilizer at all, and they don't intend to use it anymore.

Prather Ranch in California

Jim and Mary Rickert have been involved with the Prather Ranch for many years, working with the land and cattle. They received the 2015 Leopold Award for California in recognition of their accomplishments.

Intensive grazing as has been utilized on the ranch for several decades.

“This increases plant diversity,” Mary Rickert says. “The plant communities are a mix of legumes [nitrogen-fixing] and grass species to improve overall productivity without



PHOTO COURTESY OF PRATHER RANCH

Scott Simms says he applies a holistic management to grazing. Cattle graze hay meadows, from which Simms sells hay, and their manure remains as a nutrient for the soil.

the use of applied fertilizers, resulting in less labor cost.”

Pastures and rangelands are grazed to leave adequate feed and cover for wildlife and to prevent erosion. Under the Rickerts' management, the carrying capacities of these pastures and rangeland have more than doubled during the past 30 years, as a result of intensive grazing and improvements in irrigation efficiency.

Grazing management mimics native herbivores by utilizing the mountain climate and higher ground during summer and wintering in the foothills. Rickert says this pattern enables cattle to graze year-round. She says the mountain meadows are fragile in early spring, so the Rickerts delay turnout on these ranches until the grass is tall enough and strong enough to support grazing.

“We move cattle out of the winter pastures in the spring and intentionally leave enough standing grass to protect the land from erosion, provide protection and feed for wildlife, and to furnish forage for the

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cattle when they return in the fall,” Rickert explains.

On one of their ranches an innovative seeding program was accomplished many years ago by adding clover seed to the mineral mix put out for the cattle. The seed passed through the manure and was spread all over the ranch by the cows. This seeding system increased clover production significantly, with very little cost.

Sustainable grazing on Colorado rangeland

Thirty miles east of Walsenburg, Colo., the Rancho Largo Cattle Co. has 14,000 acres of dryland grazing — mixed short-grass prairie and pinion-juniper canyon habitat. Grady Grissom started in early 1996 to run the ranch in a partnership.

The area is all rangeland and arid country with average annual precipitation of 10 to 12 inches.

“When I came here, I’d had a lot of experience working on ranches. I had a good grasp of day-to-day work taking care of cattle, but in hindsight I realize I didn’t have a very good grasp of strategic management decisions,” Grissom says. “I had very little knowledge of big-picture management or ecological health.”

Grissom says when he started his focus was efficiency to maximize the stocking rate. The ranch requires about 60 to 70 acres to run a cow-calf unit year-round. Grissom explains they were asking a lot from a 200-cow operation to support his family and to allow him to save to expand.

He thought maximizing the stocking rate to spread the fixed costs over more cattle seemed a logical strategy, along with doing it the “right way” with the best cattle genetics, selective breeding, detailed animal records and



PHOTO OF COURTESY GRADY GRISSOM

A long history of leasing and summer grazing had created a system dominated by gramma grass, so Grady Grissom’s goal was to recruit more cool season grasses.

financial records, tight calving seasons, and more.

“I understood that stocking rate was the most important management decision, but I did not understand that there is no leeway to push the envelope — even with the newest breeds, feeds and technologies,” he says.

In the early years, Grissom says their overhead was too high. They tried to force the ranch to run at 45 to 50 acres per cow and experienced negative outcomes. He says they tried a number of things to alleviate the issue, but, essentially, they were overstocked and their overheads were too high.

He tried to alleviate overstocking by rotating cattle through the pastures but found that to be unsuccessful, as well, due to his lack of ecological understanding. He soon found the root of the problems they had been facing.

“I learned from Allan Savory’s book that economic success is driven by ecology,” he explains. “1998 to 2000 were transition years for us. When you group

cattle more tightly and move them, their ecological impact on the environment becomes more apparent. We developed an ecological goal. Our ranch is short-grass steppe, elevation 5,500 to 6,000 feet. We had very few cool season grasses in an environment that should support cool season grasses.”

A long history of leasing and summer grazing had created a system dominated by gramma grass, so Grissom’s goal was to recruit more cool season grasses.

He recalls the first big change was to extend recovery periods on rotations. They began at a minimum of 100 days.

“In the first couple years, we began to see results — recruiting cool season grasses and some other species including a native shrub called winterfat. In winter it can have 12 to 14% protein,” Grissom explains. “This shrub not only provides adequate protein for cows on winter pasture, but it is on the cows’ ‘candy list’ year round.”

He notes a number of other grasses like green needlegrass, silver bluestem and vine mesquite, which included both warm and cool season grasses, responded to that extended recovery. In 2000 they did some fencing and went from nine pastures to 36. This change facilitated an extended recovery period and also shortened graze periods.

“I focus on recovery period more than the length of graze period,” Grissom explains. “Even with 36 pastures I came nowhere near the stocking densities required to get a mob grazing effect. All my grazing strategies are focused on diversity of plant species, which comes mainly from extended deferrals. Now, instead of 100 days, we look at plant recovery. Our criteria is to see if the target species

has gone to seed since the last time that pasture was grazed.”

They have more than tripled cool season grasses from 2001 to the present, even facing adversity with the drought a couple of years ago. Grissom says today they are operating at 45 to 50 acres per cow, which between 1996 and 1999 was unsustainable economically. Grissom notes the change has brought their breed-back percentage up 12% and they now have a mixed operation with cow-calf and stockers, retaining some calves.

“We cut back the cow herd to give us flexibility in stocking rate,” he says. “Our stocking rate has become sustainable. Ecologically we are still improving in terms of species diversity and residual grass. We’ve made that unsustainable stocking rate essentially sustainable.”

Rock Hills Ranch — improving the land with grass

The Perman family is focused on land stewardship and improving the land with grass on their Rock Hills Ranch in north central South Dakota. Luke and Naomi Perman ranch with his parents, Lyle and Garnet Perman. Before Lyle Perman’s father purchased the place in 1975, it was a dairy and crop farm on marginal soils. His father began planting cropland back to grass and alfalfa.

Over the years, the ranch was expanded from 960 acres to 3,900 acres, with additional leased ground bringing the total to 7,500 acres, and about 5,000 acres are in grass. When Lyle Perman took over the ranch in 1979, he says his main focus was cattle and crops. Managing grass was not on his radar until the 1980s, when he became interested in conservation practices and worked with the local Soil Conservation Service and enrolled in the Great Plains program to improve rangeland.

The family continued to learn more about grazing management, the importance of rest and recovery for the plants, and the benefits of rotational grazing. Perman says some of the changes over the years included more water developments to improve pasture utilization, more crossfences, seeding pastures back to native grasses, no-till cropping and the use of cover crops after harvest. Cattle and pasture management evolved from season-long grazing to a rotational system in which the cattle are moved every few days. Lyle explains the cattle don’t spend more than 10 days



PHOTO OF COURTESY GRADY GRISSOM

Grissom says the native shrub called winterfat can have 12 to 14% protein.

in any one pasture, and most pastures are grazed only once or twice during a year. Utilizing cover crops and crop aftermath in the fall enables the rotation to facilitate full recovery for grasses after a short period of grazing.

Being able to graze cover crops and crop aftermath in this system has lowered production costs and reduced winter feeding by at least 50%, and Luke estimates the ranch is now able to winter a cow for about 85 cents per day. They graze cornstalks through most of the winter until mid-March with minimal supplemental feed. Grazing and manure also cycle nutrients on the cropland. When hay is harvested, it is fed on that same field to put the harvested nutrients back onto the land.

Leaving litter on cropland and rangeland and all the grass regrowth capture as much precipitation as possible. Thus the cropland and pastures help store moisture and are more productive during dry years. Maximizing water infiltration and minimizing runoff have also improved water quality as the standing vegetation acts as a filter for any runoff. The ranch receives about 17 inches of precipitation annually, on average, which Perman estimates is equivalent to about two billion gallons of water. The goal is to not let any of that water leave the ranch. Perman says keeping a good cover of grass and old organic matter is a top priority so precipitation received will

soak in rather than run off or cause erosion.

The Perman family's goal is to not just sustain the land but to regenerate it back to what it was in earlier times. About 60 miles of permanent fence creates 40 paddocks, which are further divided with temporary fencing. If one pasture is used in early June, it is grazed during a different stage of the growing season the next year.

When grass is grazed for only seven to 10 days out of the year, the plant communities begin to change back to native species. Having a diverse plant community benefits the grazing animals, wildlife and soil health.

Growing more grass in Saskatchewan

Art McElroy has been farming in southern Saskatchewan, Canada, since 1996. He started seeding some of his farm back to grass in 1998. In 1999 he and his oldest son took the Ranching for Profit class as a home study course and started rotational grazing. In 2005 he decided continuous cropping was not working.

"I realized we had to do something different, even though we had made some improvements with continuous cropping," he explains, "We'd started to get some cover on the ground and the water infiltration rate had improved, breaking through the hardpan with good root systems. When we came here we had only 1/2 of a percent organic matter in our first soil tests. The early

farming efforts probably reduced the soil fertility," McElroy says.

He says when they first moved there wasn't enough organic matter for any biological life. They began to think about critters below the ground, versus the livestock above the ground and realized continuous cropping was better than half-and-half summer fallowing, but it would not adequately build soil organic matter and biological life in the soil.

In 2006 they took a Holistic Resource Management course and decided they had to seed the entire place back to grass.

Along with their own cows, they started custom grazing, bringing in 1,200 yearlings from a neighbor. McElroy says it helped add manure to the soil. In 2008 they put 1,200 head on 2.7 acres for two to three hours, moving them up to six times a day.

"We had done some rotational grazing, but not to the extent we are doing now," he says. "In this region, one environmental advantage is that ranchers can usually winter graze seven or eight years out of 10. With our own cow herd, we started trying to save grass and winter graze. We did some swath grazing, and we bale graze when snow gets too deep."

Today the farm has 150 cows that completely look after themselves.

"Many things have come together in our lives the past 10 years that helped us change. I was 55 when I realized continuous cropping wasn't sustainable. The quality of life since we made the

"It is amazing how you can manage the animals in ways to improve the soil and the plants."

— Art McElroy

change has been amazing. In summer we are busy, which is a wonderful time to be busy, but the winter is easy," McElroy says. "We are grateful to be able to still do what we are doing, at this stage of our lives, and running the farm rather than the farm running us!"

He says the real progress with their grazing is probably because many of these pastures are only grazed for two to three hours each year. They have a very long period of rest. Some of the land goes to seed every year. He explains grass has an amazing ability to spread and cover the bare spots if it has a chance.

On other pieces of ground, he has seeded several species of grass and legumes in springtime when the big groups of cattle are grazing, broadcasting seed from the back of his quad. Grazing animals are the perfect tool to help manipulate progress when a person is trying to improve pasture.

"It is amazing how you can manage the animals in ways to improve the soil and the plants," McElroy says. **HW**



Over the years, Perman Ranch has included more water developments to improve pasture utilization, more crossfences, seeding pastures back to native grasses, no-till cropping and the use of cover crops after harvest.