Flagship Farmers

Lyle and Garnet Perman Rock Hills Ranch

South Dakota, USA

> A holistic view of land management is critical to the success of Rock Hills Ranch. Our goal is not to sustain what we have, but to regenerate and improve it.
>
> **Lyle Perman**

Geographic Overview

In the USA, there are approximately 727,000 beef farms and ranches, of these 91% are family owned or individually operated.

In 2017 it was estimated that there were 93.5 million cattle in the USA. Of these, 31.2 million were bred specifically for beef — with an average beef cow herd size of approximately 40 head.

South Dakota is in the Midwestern region of the USA, named after the Lakota Native American tribes. In 2018 there were approximately 32,000 farms of all descriptions, managing 43.2 million acres of land, adding $19 billion to the state's economy.

In 2018 **South Dakota had 1.8 million head of beef cows, 120,000 dairy cows, 4 million cattle & calves and 430,000 cattle on feed.** These production levels make South Dakota the eighth largest cattle producer in the USA.

325m

The United States of America is the third largest country in the world at 3.71 million square miles, (9.63 million km^2) with a population of just over 325 million people

Nº1

The USA is the largest supplier of McDonald's beef

Lyle and Garnet Perman Rock Hills Ranch

Rock Hills Ranch is situated within a watershed area of approximately 369,000 acres. In the six years prior to 2012, 21,000 acres — 6% of the entire area — was converted from grassland to crop land.

The Permans are actively involved in reversing this trend. By using managed cattle grazing to revitalize land that was once plowed, the Permans are able to return the environment to native grassland. Reversing cropland to its native state is a long term process, taking years to recover.

The Great Plains is a broad expanse of prairie land, 500 miles (800km) wide — from west to east. Encompassing 12 US states and two Canadian Provinces, the Plains cover a distance of 500,000 square miles (1.3 million km^2) the equivalent of 32 million acres.

The expansive Plains are often vertically subdivided into distinct environments — with short grass prairies to the west, mid grass prairies to the centre and tall grass prairies to the east.

Intensive hunting in the 18th century led to a drastic decrease in bison numbers, from an estimated 30-80 million, to only 300 wild individuals in the 1870s. Today, careful conservation work has increased the number to 200,000 individuals.

Through a combination of manure and selective grazing the bison are able to cycle nutrients and develop the biodiversity of the environment.

The managed cattle grazing, undertaken by the Perman family, mimics the behavior and annual grazing patterns of wild bison, leading to the benefits of flourishing plant communities.

The Rock Hills Ranch is within a watershed area of about 369,000 acres. Between 2006 and 2012, over 21,000 acres (6% of the land) was converted from grassland to crop land. The Permans are actively involved in reversing this trend by using managed cattle grazing to revitalize land that was once plowed and returning it to native grassland. This is a long-term process and cropland will take years to recover and return to its native state.

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We want to be good stewards to what we have been blessed with and set an example for our peers and those who will manage the ranch after we are gone. Of course, we need to be profitable to be sustainable, however it cannot be to the detriment of our environment or to our community.

By always evolving and improving, we can show what is possible and emulate our mission through our example and continue to be good caretakers of creation.

Lyle Perman
Owner, Rock Hills Ranch

Lyle and Garnet Perman Rock Hills Ranch

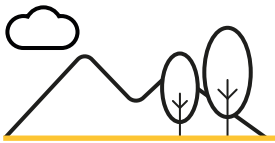
In 1975, LeRoy and Vivian Perman purchased 960 acres of land, the initial plot size of Rock Hills Ranch. Owing to the farm's marginal soils, LeRoy planted much of the ranch land with grass and alfalfa.

Lyle and Garnet married in 1976, returning to live at the ranch the following year and purchasing the ranch from Lyle's parents — Leroy and Vivian — in 1979. Lyle and Garnet have two children, Luke and Kajsa, and seven grandchildren.

In 2011 the management of the ranch was transferred to the third generation of the Perman Family. Today the ranch is managed by Lyle and Garnet's son — Luke and his wife, Naomi. Currently, the ranch manages about 12,000 acres of property, half is owned or leased from immediate family members with the rest leased from one of six different landlords. Native grasslands make up about 90% of the ranch and the remaining 20% are tillable acres planted into crop rotations including cover crops, wheat, corn, soybeans, perennial grass and alfalfa.

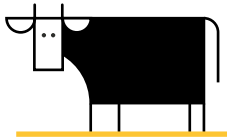
Situated in South Dakota, Rock Hills Ranch is in the westerly High Plains subregion of the Great Plains. Known as a mixed grass prairie, this area of high elevation experiences low levels of rainfall (17"–18" annually) and wide ranges in extreme temperatures. Once an area where bison and antelope roamed freely, hunted by Native American tribes, agriculture is now the primary output of the region.

The Permans are now working towards converting solar energy into human edible protein, with the dual objective of profit generation and protection of the unique short grass prairie environment. Additional developments in the form of a cow-calf operation focuses on the key principles of sustainability, providing for the long-term future of the Perman family.



12,000

Acres of land



1,500

Number of cows

80%

Native grassland

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Ranch Management

The ranch is split into 120 permanent pastures with temporary poly-wire fencing being used to further divide pastures throughout the year to achieve different grazing objectives. Water is the most limiting factor in providing additional paddocks and several custom water improvements are utilized. The Perman family have purchased a number of large, used mining truck tires that have been cut in half to serve as water tanks. Lyle designed a custom, frost free filling mechanism and continues to tweak the design overtime. It was noted that this type of water source can supply enough water for a herd on hot South Dakota summer days, hold up to freezing temperatures and overall rugged use. It's a point of interest with other cattlemen when they visit and tour the ranch.

The Perman family are beginning to integrate cover crop cocktails and diverse mixes of annual and perennial plants into the ranch's row-crop operations. Austrian winter pea, oats and hairy vetch can all be found growing on the ranch, these plants were no-till planted on a spread of 200 acres — land which is grazed by contracted stocker calves. Recently, the ranch began running this stocker program to maximize underutilized perennial grass and to integrate into the cover crop grazing program.

The stockers allows the ranch to receive compensation based on average daily gain and on a price-per-head, per-day, basis which mitigates the ranch's risk while they experiment with cover crop cocktails. This production system is unique to both South Dakota and the wider USA, a system which often has neighbouring farmers asking *"What are the Perman's doing over there?"* Luke Perman is now looking forward to seeing how the stockers gain on the cover crops and what the benefit will be to next year's cash and row crop operation.

Genetics & Animal Welfare

Wagyu and Akaushi bulls have been incorporated into the Rock Hills Ranch breeding program, initially on a contract basis to provide a terminal cross to a forward contracted buyer. However, the outcross provided a noticeable improvement on heifer calving ease. The ranch does not regularly receive performance or carcass data on the calves it sells, but they expect the Akaushi sired calves to have quality grades similar to Wagyu sired calves, but without potential loss in feed efficiency and performance often seen with the Wagyu breed. Wagyu are only used on heifers, due to the calving ease they bring.

Fenceline weaning is a low stress way to wean calves from their mothers. At the ranch this typically means separating cows from their calves, with the calves being confined in a pen with a fence that abuts their mothers.

By introducing low stress weaning, cows and calves are able to both see and have physical contact with one another through nose touching. Even in this type of system, calves often discover ways to break down fences or find openings to escape. The Permans modified this approach by reversing the cows and calves — the mother cows are penned while the calves are allowed more access to pasture and freedom to roam.

By introducing a modified low stress system of fenceline weaning, the Permans have found that their free roaming calves quickly calmed down and began grazing, almost immediately. This focus on the welfare of the animals demonstrates the positive benefits that come as a result of making small changes and thinking differently.

Core Values and Goals:

- Develop a self-supporting business with resources and production systems that allow each family member to contribute
- Instill a sense of ownership and work ethic
- Provide economically for two families
- Preserve native landscapes/natural prairie through cattle production
- Maintain a welcoming atmosphere for visiting family and guests
- Leverage resources in a sustainable and responsible manner
- Ensure time away from ranch work for education, family and hobbies

Lyle & Garnet — Rock Hills Ranch Sustainability Objectives

Environment

- Increase ranch biodiversity by protecting and enhancing the natural habitats, which in turn supports the return of native flora and fauna — demonstrated by increasing numbers of plant species and wildlife observed
- Optimize pasture productivity and plant diversity via rotational and targeted grazing — with the ability to split the ranch's 120 paddocks into smaller areas
- Increase the eco-system services provided by the ranch, through annual tree planting — which sequesters carbon, provides shelter and maintains habitats
- Conserve and improve the health of soils through no-till crop planting practices
- Protect and conserve fragile, delicate environments and unique habitats by stopping conversion of native pastures and protecting those present on the ranch
- Return cropped land to native grass prairie for grazing — by planting native grass and forbs on 350 acres of once farmed and tilled land

Economics

- Match cattle numbers and production to the ranch's production capacity
- Improve diversification income with hunting by developing and maintaining native habitats
- Create and develop a sustainable business to support the next and future generations of the Perman family

Ethics

- Protect and improve animal health and welfare by implementing new practices around animal handling, fenceline weaning and herd health planning
- Produce food (beef) safely and transparently
- Deliver outreach programs for the local community, along with educational visits for youth groups
- Share best practice, learnings and knowledge with other ranchers and the wider beef industry
- Ensure livestock genetics are fit for the environment and market requirements by introducing new breeds

No-Till

All crop residues after harvest and grazing are left on the surface of the soil cropped land. No cultivations are undertaken, with the next crop drilled directly into the surface of the soil.

The most instrumental factor influencing biological activity within the soil is the amount of organic matter present. Organisms such as bacteria, fungi, earthworms and nematodes feed on this organic material — breaking it down and causing decay. Once decayed, the health of the soil is improved — with increased levels of drought tolerance and reductions in soil erosion.

Key Outcomes & Actions

- Improved soil organic matter levels
- Boosted soil organic matter increases carbon sequestration and levels of water retention capacity of the soil
- Prevention of wind and water borne soil erosion
- Increased drought tolerance, water infiltration rates and reduced evaporation losses from the soil
- Reduced crop establishment time and cost

Rotational Grazing

The ranch operates a rotational grazing program known as multi-paddock adaptive grazing, which has numerous advantages over continuous or set stocked grazing. The program involves moving cattle through 120 pastures areas which are further subdivided during periods of high grass growth.

This program mimics the grazing pattern of buffalo which helps to form the biodiverse habitats of the Plains.

Key Outcomes & Actions

- Targeted grazing has helped control undesirable plant populations
- Increased number of desirable plant/grass species
- Optimized forage production and intake
- Pastures are rested and allowed to recover without being over-grazed
- Cows no longer need to be wormed due to breaking the parasite lifecycle
- Improved drought tolerance of pastures

Habitat Protection

Rock Hills Ranch has 10,800 acres of mixed grass prairie, an environment which forms an integral part of the cattle operation.

These native grasses and habitats are key to the future sustainability of the ranch. The native flora, which has adapted over a period of several millennia, is able to withstand the unique environmental conditions — including severe drought and extreme variations in temperature.

Key Outcomes & Actions

- Helped to protect a unique and valuable habitat
- Utilized the habitat as a way in which to produce human edible protein
- Increased levels of additional income via commercial hunting

Water Provision

To manage a rotational grazing system — providing good drinking facilities for the cattle is essential. Ensuring clean water is easily accessible to the cattle guarantees they are not walking for several hours per day to get to it, as cattle will prioritize walking for water over eating.

The Permans have invested in 15 miles of piped water infrastructure and 61 large water troughs made from recycled earth mover tires.

Key Outcomes & Actions

- Stock are provided with easy access to clean water
- Optimum clean water provision to cattle continues to improve health and productivity
- The rotational grazing system is utilised to full effect

Grazing Corn Stalks

The ranch has capitalized on the abundance of cornstalks locally, stalks which are left after grain harvest. Cattle spend the winter eating the leaves and husks — a process which has eliminated the need to provide supplemental feed, such as hay. Therefore, cattle feeding during winter is far simpler and less costly in terms of time and machinery.

The manure from the cattle is then deposited directly on the cropland which helps recycle and replenish nutrients, reducing the subsequent need for artificial fertilizer.

Key Outcomes & Actions

- Reduced winter-feeding costs by 50%
- $1 per day/per cow cheaper than feeding hay
- Prioritized grazing pastures over making hay for winter feed, reduced machinery and time cost

Genetic Improvements

The dam line of Rock Hills Ranch is an Angus which is being crossed to a terminal Wagyu sire. This breeding has increased the hybrid vigour of calves, in turn reducing mortality and morbidity rates while improving carcass grades at slaughter.

A selection of best quality home bred Angus females are retained and crossed with an Angus sire to produce replacement heifers for the herd, helping improve herd genetics and maintain a high herd health status.

Key Outcomes & Actions

- 10–20% premium paid on weaned calves from Wagu sires
- Reduced mature cow weight by 200lbs (90Kg) to 1250lbs (570kg), which has also reduced feed costs
- Improved fertility rates, conception rates on cows >90% (60 day cycle with bulls), heifers >80% (1x AI, plus 30 days with bull)

Lyle Perman

"When we consider implementing a new practice, we consider 'our portrait' and how this practice may impact our surrounding eco-system. As more grasslands are converted, it will be critical that remaining intact prairie be healthy and thriving to support both our livelihood as ranchers and wildlife species that also need grass to thrive. We practice no-till farming, utilize cover crops and try to have livestock graze as many acres as possible to improve the soil and prepare it for rain events — so that we can capture each drop of rain that falls on our ranch."

The first thing we consider is:
"How does it impact our eco-system?"

The second thing we consider is:
"How does it impact our quality of life?"

Our final consideration is: **"Is it profitable?"** Not everything we do is profitable in the short term, but if it positively impacts our environment and quality of life we are okay with it. We understand that working with natural cycles is a long-term commitment — and we are here for the long haul.

"The landscape of any farm is the owner's portrait of himself."

Aldo Leopold (1887–1948)
Considered by many to be the father of wildlife ecology and the US wilderness system

Partnerships, Knowledge Exchange & Shared Values

Partnerships

Lyle and Garnet purchased Rock Hills Ranch in 1979. This was a period which saw the conversion of 1,000's of acres of pastureland into crop land. At this time Lyle and Garnet's focus was on the production of beef, therefore protecting these pasturelands and habitats was an integral part of that system. These unique habitats in South Dakota are now, more than ever, under threat from conversion into crop land. The loss of these habitats, along with the valuable eco-system services they provide cannot easily be replaced or replicated.

Having vision and commitment to pioneer new concepts and ideas can be a challenging journey — but there are always opportunities to collaborate, partner and work together to learn and make the best decisions about adopting new practices. The Permans have been working in partnership with multiple stakeholders and institutions — to improve their knowledge and to better understand the practices which provide the most positive impact on both the current running and future development of their ranch.

The partnerships made have led to increased levels of skills and knowledge. This new found information has led to the identification of important forbs, grasses and wildlife species; important indicators of rangeland health and biodiversity, fauna such as the Common Night Hawk, the Prairie Sandpiper, and the American Kestrel.

Partnerships cont'd

The Permans work with numerous industry bodies and institutions, including; Ducks Unlimited; Farm Service Agency; Game, Fish and Parks; Holistic Management International; Natural Resources Conservation Service; Pheasants Forever; Ranching For Profit School/ Ranch Management Consultants; South Dakota State University Extension Service; SD Grassland Coalition; Soil Health Coalition; US Fish and Wildlife Service; Walworth County Conservation District and World Wildlife Fund.

In 2014, Rock Hills Ranch was the recipient of the **South Dakota Leopold Conservation Award** and the **National NCBA Environmental Stewardship Award** in recognition of the great work they have done on their ranch.

Knowledge Exchange & Shared Value

The Permans have been offering internships on the ranch since 2013. They have developed two types of internship program — the first being a technical internship which focuses on ranch management including grazing, beef production basics, low stress handling techniques, herd health, fencing, weed control and habitat management.

The second internship is cultural, covering aspects of agriculture lifestyle including growing vegetables, cooking skills and caring for farmyard animals such as chickens and horses. This cultural internship provides an opportunity for people with limited or no agriculture experience to spend time on a working cattle ranch and assist Garnet Perman with ranch visits, preserving garden products and maintaining the ranch headquarters. The Permans receive around 75-100 applications annually, of these applicants — nine interns have been hosted over the past six years.

In 2014 the Permans developed the 100th Meridian Trail, so named as the ranch is located on the 100th Meridian. The trail offers hikers the opportunity to use GPS beacons to locate stone markers along the eight-mile route. Each marker provides either an important insight into the ranch's history or a conservation lesson. Additionally, hikers and visitors can find information about both the area and the ranch in the form of a printed brochure.

Regenerative Land Management

> This is regenerative agriculture at scale, the Permans are using cattle to improve the land!
>
> Jeff Goodwin,
> Noble Research Institute

The Perman's production model revolves around a focus on regenerative grazing practices that not only sustain natural resources but also improves them. Areas that were once plowed are now visibly recovering — springs have sprung up due to increased levels of soil water retention and native grasses are flourishing. These native grasslands are the United States version of rainforests, they hold biodiversity, soil carbon, heritage and eco-system services that cannot be fully enumerated.

This general lack of understanding about the eco-system of the local landscape has led to poor landscape management and lower levels of profitability. Reduced levels of understanding have often resulted in the grasslands being converted to cropping, a decision which has impacted water cycles, increased soil erosion and led to a loss of native plant communities.

"At Rock Hills Ranch, we use cattle as a tool to improve the soil, water and air on our crop ground and grasslands. By doing this, we are working with the carbon cycle. It is our goal to not just be carbon neutral, but to actually sequester and store more carbon than we emit.

A holistic view of land management is critical to the success of the ranch. Our goal is not to sustain what we have, but to regenerate and constantly improve it. Over the past decade or two, we have observed wetlands, and low areas in the region, flood to a greater degree than they ever have before. This negative impact is a result of increased conversion of grassland to cropland. Water no longer can soak in; instead it runs off creating the flooding issues that have affected much of eastern South Dakota."

Lyle Perman

At Rock Hills Ranch, we focus on capturing every raindrop. The ranch receives approximately 17 inches of precipitation annually and one of our primary objectives is to ensure we don't lose a drop of that water.

To achieve this objective, the Permans focus on maintaining grass or crop residue on the land and avoiding bare ground. When bare soil is exposed, rainfall runs off quickly because there is nothing to hold it there. Without a cover, bare soil also heats up faster in the sunlight (daytime temperatures of 100°F can heat bare soils to 140°F), and more soil moisture is lost to evaporation. Therefore, keeping a good cover of grass and old organic matter is a top priority. Decisions to rotational graze, no-till farm and plant cover crops were all made to increase productivity — including aspects such as how much water will soak into the soil after a heavy rain or fast snowmelt.

The rotational grazing systems used by the Permans during the growing season allows cattle to move to fresh pastures frequently so a pasture may be grazed only once or twice per year, allowing ample time to regrow and deepen roots. Generally, the cattle do not spend more than 10 days in any one pasture. Cross fencing is key to this system. Rock Hills Ranch has over 100 miles of permanent fence, about half of which is perimeter fence — the rest divides pastures into smaller paddocks. Additionally, temporary fence is used to split many of the 120 permanent paddocks into even smaller paddocks for grazing, depending on conditions. The Permans have also fenced livestock out of Swan Creek, which bisects the ranch, to limit access during the growing season.

To further enhance land health — the ranch is serviced by four wells, four rural water hookups, 15 miles of waterlines, 61 stock tanks, 45 dams & dugouts and two developed springs. By having so many watering points, the Permans can affect the grazing distribution of the cattle and achieve a more uniform utilization of each pasture, not to mention the improvements in quality to the cattle's drinking water. The Permans have also installed energy free winter water tanks that utilize geothermal energy, so that no power is needed to keep cattle drinkers open in the winter.

Having a diverse plant community benefits soil health as well as a variety of wildlife, so the Permans do their best to maintain a healthy mix of plant species. A healthy wildlife population also reflects the healthy eco-system they've produced on the ranch. Raising wildlife is a byproduct of what they've done to improve the land for cattle production.

The Permans are careful about the seasonal use of their pastures. If a pasture is used in early June one year, the family will aim to graze it during a different stage of the growing season the following year.

By selectively utilizing intensive grazing pastures, the Permans are able to alter and manage plant communities. If undesirable plants, such as Kentucky Bluegrass or Western Snowberry, have taken over a certain area — cattle grazing is restricted to that area. The concentrated hoof action breaks up the plants and creates a renewed growing environment where more desirable plant species can take hold. Cattle eat most plants at some point in the year, so tailoring a grazing plan to get cattle in the right place at the right time helps utilize nearly all species of plants growing on the ranch. Having a plan to graze year-round, not just during the summer, helps better utilize the ranch.

Thirty years ago, the Permans did not have the holistic view that they have today. Their grazing program has allowed them to graze seven to ten days and rest for 355-358 days. When the Permans work in this way, they see more warm-season grasses such as Big Bluestem, Sideoats Grama and native forbs. Having a diverse plant community benefits soil health as well as a variety of wildlife, so the Permans do their best to maintain a healthy mix of plant species. A healthy wildlife population also reflects the healthy eco-system that they have produced on the ranch. Raising wildlife is a byproduct of what they've done to improve the land for cattle production.

The Perman's decision to introduce a management practice also takes into consideration the impact farming will have on a variety of species such as the dung beetle, the common nighthawk and the lead plant. While the family do not have specific scientific data or metrics to support use of these practices, they have seen an increase in the diversity of plant communities as well as improved soil health. The Perman family have witnessed that their continually refined practice management has led to the increased health of the local wildlife population.

Flagship Farmers

> We understand that working with nature is a long-term commitment and we're here for the long haul.
>
> Lyle Perman

Contact

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