SUMMER 2021

A REGENERATIVE RANCHING PUBLICATION FROM NOBLE RESEARCH INSTITUTE

LEGACY

FIND OUT HOW THREE RANCH FAMILIES FROM ACROSS THE COUNTRY ARE:

BREAKING

BARRIERS

TO REGENERATIVE AGRICULTURE

SPECIAL 75TH ANNIVERSARY EDITION

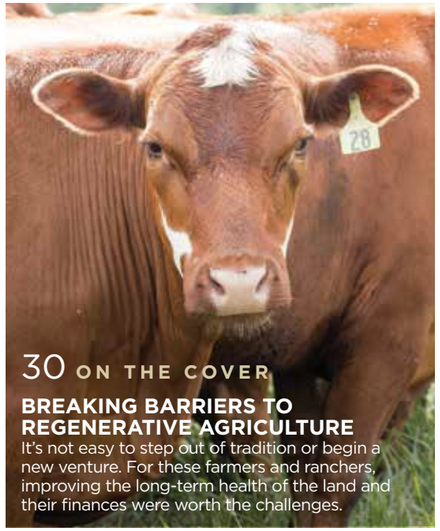
CONTENTS

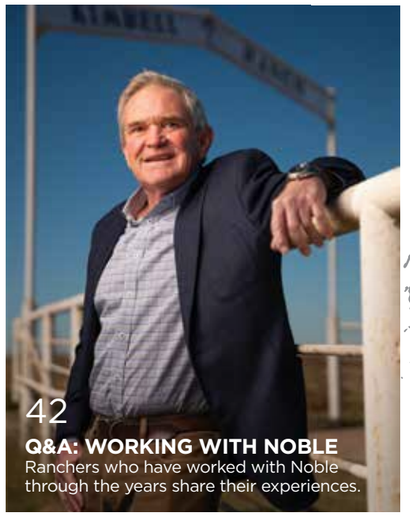
SPECIAL 75 ANNIVERSARY SECTION

CELEBRATING A MILESTONE

Noble Research Institute is now 75 years down the road of coming alongside farmers and ranchers on their journeys in agricultural production. This anniversary year offers the opportunity to honor the organization's rich history and deep roots in agriculture while looking ahead to how the organization is growing and evolving to meet the challenges of tomorrow.

TURN TO PAGE 12 TO READ MORE ABOUT NOBLE'S ROOTS IN AGRICULTURE





ON THE COVER: Starting down the regenerative ranching path is not without its challenges. These ranchers from across the U.S. are breaking barriers and overcoming the challenges. They are finding benefits to both their bottom line and the health of the land.

LEGACY

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Reprint requests may be made by contacting J. Adam Calaway, director of communications and public relations, at 580-224-6209 or by email at jacalaway@noble.org.

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NOBLE RESEARCH INSTITUTE

TO OUR READERS:

TELLING YOUR STORY

Almost 15 years ago, we established *Legacy* magazine with a simple idea: To tell Noble's story.

We wanted to provide an inside, in-depth look at Noble's people and programs. Today — with some 30 issues under our belt — *Legacy* has chronicled our consultation outcomes, educational activities and research discoveries. In each story, we sought to demonstrate how this work benefits real farmers and ranchers and, in turn, society as a whole.

The magazine's name pays homage to the legacy left by our founder, Lloyd Noble. We, the employees of Noble, share a fundamental belief that everything we do is the direct result of the generosity and wisdom of Mr. Noble. We are stewards of his vision. We are his living legacy.

As Noble refocuses its operations on regenerative ranching (see page 24) so too will *Legacy* refocus. We will shift our lens outward. The stories within its pages will no longer be solely Noble-centric, but we will tell a much broader story — the story of farmers and ranchers who have chosen to walk the regenerative ranching journey. In doing so, *Legacy* will become one of the first publications in the United States dedicated to regenerative ranching.

Legacy's name now takes on a dual meaning. It still represents our founder, but now it also symbolizes the far-reaching legacy that underscored his bold vision: the legacy of the soil. Mr. Noble saw the perpetual need to safeguard and "up-build" the soil. This was his motivating factor for forming Noble Research Institute in 1945.

Soil, he believed, was the foundation of agriculture, and agriculture was the cornerstone of society. Less than a year before his death in 1950, Mr. Noble said: "No civilization has outlived the usefulness of its soils. When the soil is destroyed, the nation is gone."

So *Legacy* will now provide the inside, in-depth look at the regenerative ranching champions, those individuals committed to rejuvenating the soil, as well as the individuals, companies and organizations, who follow in Mr. Noble's footsteps by supporting these soil rebuilders through grants and donations.

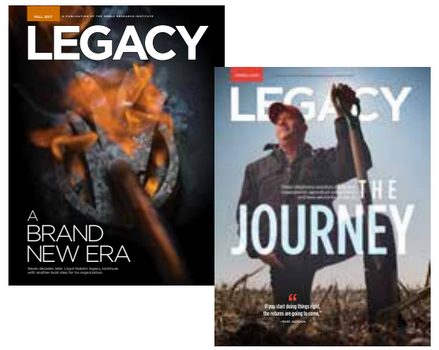
Each issue will dive into various steps along the regenerative ranching journey. Some ranchers we highlight will have applied regenerative principles for decades; some will just be beginning their adventure. In this issue, *Legacy* highlights the barriers that can prevent most producers from even stepping foot on the road (page 32). We hope that this incredible story will inform and inspire you.

Noble is dedicated to assisting farmers and ranchers as they regenerate the land in a profitable manner so that they

may leave their land better at sunset than it was at sunrise. It is one of the greatest stories of our time, and we here at *Legacy* are eager to tell it.

Blessings on your journey,

J. ADAM CALAWAY, EDITOR



NOTABLE ISSUES: *Legacy* will become one of the first publications in the United States dedicated to regenerative ranching.

SOIL EROSION: PREVENTING ANOTHER DUST BOWL

While soil erosion is a natural process, humans have the ability to assist, mitigate or defeat erosion. The good news is, regenerative agriculture is a tool in the battle against erosion.

by Marilyn Cummins

Mention soil erosion, and you may recall dramatic photos from the Dust Bowl, where winds blew soil parched by drought and left unprotected by poor farming practices in Oklahoma, Texas, Kansas, Colorado and New Mexico. In May 1934 alone, an estimated 300 tons of soil were removed from the region and dropped over large portions of the eastern United States.

However, erosion is not just a thing of the past. Today, Oklahoma Cooperative Extension says 50 million tons of soil are washed away from the state's land every year by water erosion, now the major cause of soil loss in the state and other parts of the U.S. Wind is also still a threat, especially during drought years.

WHAT IS SOIL EROSION?

Soil erosion is the detachment and movement of soil particles from the point of origination through the action of water or wind. It's a naturally occurring process that affects all landforms, with geologic erosion creating natural wonders like the Grand Canyon and the Badlands of South Dakota over millions of years. But human activity can leave soil quite vulnerable to the power of nature, with each raindrop hitting exposed soil like a tiny bomb, splashing soil up to 3 feet in the air and carrying it away in runoff water.

WHY IS EROSION A PROBLEM?

The displacement of healthy, productive soil reduces the area that can viably produce crops or grazeable plants for grazing animals. Simply, our agricultural lands shrink. Soil erosion also damages the environment, as disturbed and misplaced soil and nutrients pollute air and water. Erosion takes an economic toll on farmers who lose fertilizer, soil organic matter and crop yields; on land owners who lose productivity and land value; and on all of us when food production, water quality and more are impacted.

HOW CAN WE HELP?

The good news is that farmers and ranchers can reduce the risk of erosion by considering the soil when making management decisions. They can protect the soil from being moved by wind or water while also rebuilding the depth and health of topsoil by following the six soil health principles.

In the context of a properly managed production system, the six principles of soil health are:*

1. Know your context.
2. Cover the soil.
3. Minimize soil disturbance.
4. Practice plant diversity.
5. Maintain continuous living plants/roots.
6. Integrate livestock.

**Source: www.understandingag.com*

SUCCESS IN SIGHT

Producers are already succeeding. According to the U.S. Department of Agriculture's National Resources Inventory, soil erosion rates on U.S. cropland decreased 34% between 1982 and 2015 thanks to conservation practices. Regenerative ranching applies the principles of regenerative management on the nation's grazing lands, addressing the more than 650 million acres of land that impact our surface and ground water, food production, air and wildlife habitat.

IN THE SOILS LABORATORY, 1940s TO TODAY

From a broom closet to a modern laboratory, soil testing has been at the heart of Noble research and services for 75 years.

by Marilyn Cummins

It's fitting that the first laboratory established at Noble Research Institute was a soils lab, providing a tangible way to help land managers learn about soil fertility and what their fields and gardens needed to thrive. Soil tests remain a valuable tool for today's producers as they manage crop nutrients and make land management decisions.

Some things have come a long way since the late 1940s. M.K. "Bud" Patterson, Jr., Ph.D., who served as an intern starting in June 1948, later recalled grinding soil samples by hand in a broom closet and using an open-flame distillation method to analyze samples for nitrogen. The process generated so much heat that they did it at night in their underwear.

One technology upgrade came with a machine-driven mortar and pestle, patented in the late 1950s and still in use today to grind small batches of soil samples to a uniform particle size. It's a large, upright machine that functions like a drill press, with a lot of reaching, pushing and bending on the part of the operator during the four minutes it takes to grind a 1-pint soil sample, says Tabby Campbell, supervisor of Noble's Ag Services and Resources Core.

Today, most of the 8,000 soil samples sent to Noble from producers and gardeners and 6,000 internal research samples each year are processed in two minutes per pint with a push of a button on a modern table-top grinder. The ground samples are sent out to contract laboratories for testing analyses.

Mason Stewart, an ag services and resources assistant, grinds soil samples for testing.

While the basic elements of soil being assessed have not changed in the past 75 years, there are new ways of looking at soil that go beyond the standard nutrients and into the biological aspects of soil health. Tests like the Haney soil health test also look at nutrients for microbial consumption, based on how much carbon and nitrogen is available, and a carbon-dioxide respiration test in the lab.

To learn more about how to take a soil sample and submit it to Noble for testing, go to www.noble.org/ag/services/testing/soil-sampling/

Noble Soils Lab Early Timeline:

SEPT. 19, 1945

Lloyd Noble founded the organization that would evolve to Noble Research Institute.

SEPT. 13, 1946

Noble board approved renting space on second floor of the Von Weise office building, on the corner of C and Main streets in Ardmore, Oklahoma, for the organization's offices and the soils laboratory.

1946

A three-year soil and garden contest with cash prizes was established to create interest in soil improvements. In the first two years, the Noble laboratory staff analyzed approximately 6,000 soil samples to make more than 45,000 fertilizer, planting and soil conservation recommendations.

1948

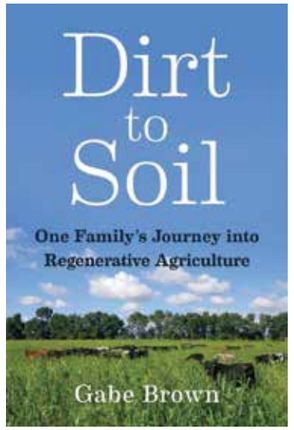
The first soils laboratory director Thomas A. McCoy and intern M.K. "Bud" Patterson, Jr., Ph.D., who retired from Noble 45 years later as director of the biomedical division (which was transferred to Oklahoma Medical Research Foundation that same year), later described the state of the lab in its first two years:

- Air-dried soil samples were ground to uniform particle size by hand in a broom closet in the lab above the A&P grocery store in Ardmore.
- At first, a rather primitive "kit" analysis used chemical reactions that produced colors to compare against a chart to see how much of an element was present.
- Noble scientists were also just starting to solve their own research problems, McCoy said, with the hope that "someday the (organization) may in some way add to the vast knowledge of soils and to the nutrition of the plants, animals and humans who are so dependent on those soils."

PepsiCo's 7 Million Acre Pledge

In April, PepsiCo, Inc., announced an initiative to scale regenerative management of 7 million acres (a chunk of land larger than the state of Connecticut) by 2030. The pledge is part of the PepsiCo Positive Agriculture initiative, which also promises to "improve the livelihoods" of more than a quarter of a million individuals in its supply chain.

Read more as part of this report from *Successful Farming*: bit.ly/pepsi-regen



Dirt to Soil: One Family's Journey into Regenerative Agriculture

This book is a must read for any farmer or rancher beginning their regenerative agriculture journey. Author Gabe Brown is a pioneer of the soil-health movement and has been named one of the 25 most influential agricultural leaders in the United States. Brown; his wife, Shelly; and son, Paul, own Brown's Ranch, a holistic, diversified 5,000-acre farm and ranch near Bismarck, North Dakota. This book details their journey from conventional producer to regenerative advocate.

Don't Just Sustain. Regenerate.

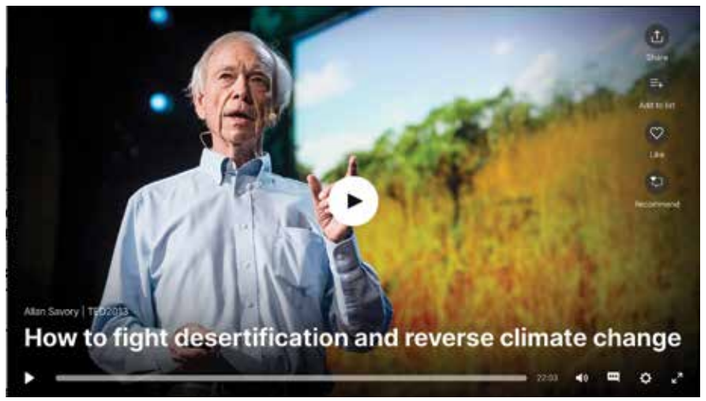
In a powerful editorial, General Mills argues that sustaining degraded land does no one any good — the land must be regenerated. Doing so will build resilience and help curb climate variability. In this visually rich article, one of the country's most respected and storied food companies discusses the need for regenerative ranching and what it is going to do to help.

Read the full article: bit.ly/regen-ag-climate-change

Large-Scale Regenerative Transition

In an in-depth interview, Terry McCosker, discusses everything from pasture ecology to proper farm succession strategies as part of making a large-scale transition to regenerative agriculture. McCosker is one of Australia's acclaimed regenerative agriculture thought leaders who has worked with about 10,000 Australian farmers.

Listen to the podcast here: bit.ly/transition-to-regenerative



The Father of Holistic Management

More than 7.5 million people have watched Allan Savory's Ted Talk since it was posted in 2013. Eight years later, it is still a powerful testimony to how soil health and integration of large grazing animals can combat degrading lands and desertification, conserve water and combat climate variability.

Watch here: bit.ly/fight-desertification

Letter to the Editor

To whom it may concern,

I'm a long-time Noble cooperator and thus a considerable and grateful consulting and education beneficiary as well as an appreciative recipient and reader of Noble publications.

On that latter note, I just wanted to say that the latest edition of *Legacy* is the finest in my memory. What a terrific read! From the excellent president's message, to Adam's poignant concluding piece on our "Stormy Present," and pretty much all the content in between, *Legacy* is a thoughtful, relevant and well written publication.

Just thinking no deed so good should go unnoted and uncommented on.

I also want to add my special, personal thanks to the consulting team members I've worked most closely with and learned the most from over the years, including, and in no particular order:

- Hugh Aljoe (my ranch management guy)
- Dan Childs (my ag economist and ag tax guy)
- Robert Wells, Ph.D. (my cow guy)
- Devlon Ford (my fencing guy)
- Mike Porter (my what-the-heck-to-do-with-a-deer-after-I-shoot-it guy)
- Russell Stevens (my pasture and fire guy)

Thanks for the really good work. I think Noble Research Institute typifies the best of our country, and at a time when such standout excellence is particularly valuable.

Cheers!
Guy Cumbie
Bar C Bar Ranch
Beef Cattle and Hay
Wise County, Texas
www.barcbarranch.com

75 ANNIVERSARY

BIRTHDAY KICKS OFF WITH

BEEF

Beef has always been important to Noble Research Institute because of the many producers we work with who use cattle to improve the land. We are proud to support them in their journeys to restore soil health and overall ecological function of grazing lands across the country while producing nutritious protein and improving water and air quality for all of society to enjoy.

In honor of our 75 anniversary, we have compiled 75 facts about beef that you won't want to miss. Here are some of our favorites:

1 U.S. farmers and ranchers produce 18% of the world's beef with only 8% of the world's cattle.

2 In 2018, U.S. consumers purchased 26.7 billion pounds of beef at foodservice and retail locations.

26B

3 A 1% increase in soil organic matter can help the soil hold about 20,000 gallons of additional water per acre.

4 91% of beef farms and ranches are family-owned or individually operated.

91%

5 Pasture and rangeland represent 41% of land usage in the U.S.

6 The carbon footprint of a unit of beef produced decreased by 16% from 1977 to 2007.

C CARBON

You can find the full list at www.noble.org/75-facts-about-beef.

FROM YOUR FEEDS

FOLLOW ALONG @nobleresearchinstitute @nobleresinst

We have dug through the internet and found a treasure trove of soil health inspiration from peers within our network. We hope you enjoy this special selection. What goodness are you seeing in your fields? Connect with us on Facebook, Twitter and Instagram to tell (or show) us!

"Soil carbon sequestration is just going to be a natural consequence of proper farm management and proper grazing management," says David Johnson, Ph.D., Rodale Institute microbiologist. "Bringing the soils back and having them be more productive will capture more atmospheric carbon." **@rodaleinstitute**

Worms are incredible creatures and provide countless benefits to the soil. **@national_grazing_lands**

Regenerative #ranching uses a dynamic and holistic approach to draw down #carbon into the #soil. Doing so can dramatically affect the #climate in extremely positive ways. #RegenerativeAgriculture #RegenerativeRanching #ClimateActionNow **@regeneration_in**

Livestock play a crucial role in not only maintaining but regenerating ecosystem health when managed properly. **@savoryinstitute**

JOIN US AT NCBA

Nashville, TN | Aug. 10 - 13 | Booth #330

Don't chance the ranch! Building up your ranch's soil health using regenerative ranching can help you be profitable today and ensure your land's legacy for tomorrow. Join us to learn more about how you can get started on the regenerative ranching journey. You'll also have the chance to play a game of Plinko and win prizes, including grazing sticks and entry into a drawing for one of two professional drones.

Instagram TOP 5

FOLLOW ALONG @nobleresearchinstitute

5. Check out these beef truths we have gathered for #BeefMonth. **4.** We are focusing our operations on regenerative agriculture, and we have set a goal to regenerate millions of acres of degraded grazing lands across the United States. To read more, visit: http://bit.ly/regenerative-ag. **3.** Regenerative agriculture and organic are not the same. Discover the differences at http://bit.ly/organic-vs-regenag. **2.** Researchers, educators and consultants from across Noble are meeting in the field over the next few weeks. They're learning more about soil health and regenerative agriculture from Understanding Ag and looking for ways to better serve ranchers wanting to improve their grazing lands. **1.** *The New York Times* shares how a Texas cattle rancher is using regenerative ranching to improve his land. To read more, visit: http://nyti.ms/3s3qVwd. PC: @nytimes

3 Things to Look Up

10 Agriculture-Related Instagram Accounts You Should Follow

Whether you're in the cattle industry and want to see your peers at work or you are someone who is simply captivated by farm life, here are 10 of the top agriculture-related Instagram accounts you need to follow today.

To read more, visit: bit.ly/IG-to-follow

Worms Welcome

When it comes to soil health, worms are always welcome! But have you heard of the latest W.O.R.M.S. program from the Oklahoma Conservation Commission? Working On Regenerative Management Systems program is a new initiative to help farmers and ranchers track the progress of the soil health work they undertake on their land. The Southern Plains Perspective explains the program.

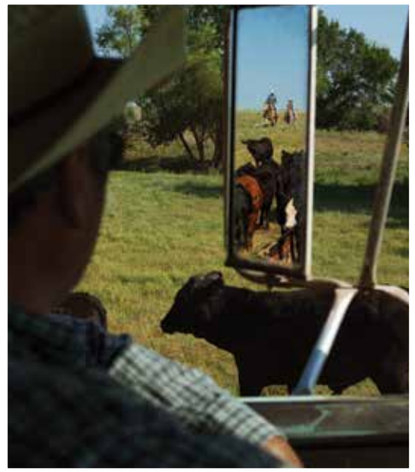
To read, visit: http://bit.ly/WORMSprogram.

Ag Ranks No. 1

Farming and agriculture topped the 2020 Gallup poll ranking Americans' views of various business and industry sectors. The survey found a 69% positive rating for farming and agriculture, an 11-percentage-point increase from the previous year. The industry was already among top-rated industries.

To read more, visit: bit.ly/347c9ud

1945



DEDICATION TO THE SOIL RISES FROM THE DUST BOWL

In 1948, Lloyd Noble told the Tulsa Farm Club about being struck by his view of the land from the air a few years after the Dust Bowl. On lands that had "produced 50 bushels of corn or a bale of cotton upland; 100 bushels of corn, two bales of cotton on the bottom," during his youth, he had seen "the devastating effect of erosion, the abandoned houses (and) rubble of the old rock fireplaces." Individuals and communities suffered when the land could no longer support agricultural production due to the loss of productive soil. That's why he created Noble Research Institute in September 1945 — to help revitalize agriculture and, in effect, rural communities.

2020

LLOYD NOBLE:

A MAN FOR PEOPLE AND THE LAND

An oilman felt the responsibility to use his resources to help farmers and ranchers improve their livelihoods, and benefit all of mankind, by rejuvenating the land.

BY COURTNEY LEEPER

Lloyd Noble knew there was more to the land than just the oil he had found beneath it.

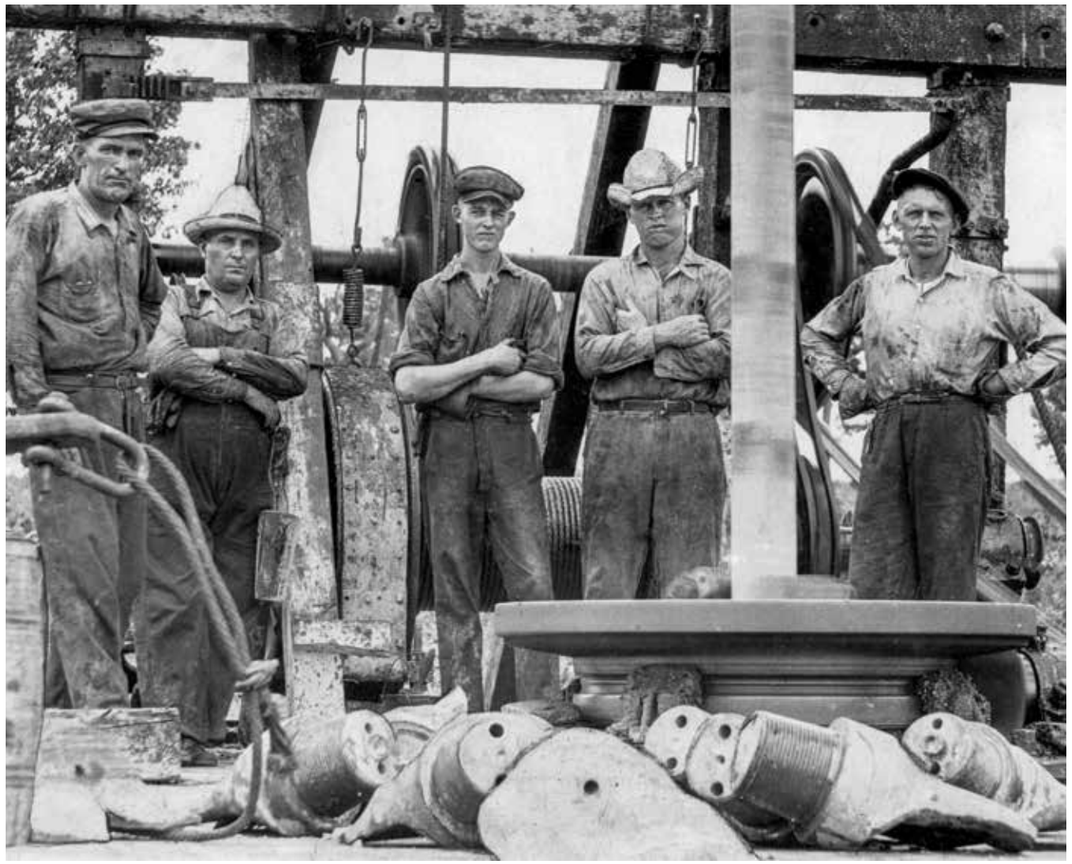
Noble was born in 1896 in Indian Territory, in the train depot town of what is now Ardmore, Oklahoma. He was the son of pioneers who had come from New York looking for new opportunities. His parents, Samuel and Hattie, and his uncle and aunt, Edward and Eva, farmed and operated various businesses in Texas and what is now Oklahoma before settling in Ardmore, where they started a hardware store the same year Lloyd was born.

Noble Brothers Hardware provided wares to the local farmers and ranchers, and, as a boy, Lloyd Noble swept floors, stocked shelves and delivered goods for the store. He came in frequent contact with these agricultural producers and admired them for their diligence and humility. He also saw that the early settlers did little to conserve or build up the soil as they generated their prized commodity, cotton, year after year.

FAMILY MAN

Lloyd Noble married Vivian Bilby in 1924. They had three children: Sam, Ed and Ann. After Vivian died in 1936, he raised his young children with a strong work ethic and family values with help from his mother, Hattie Noble, and housekeeper, Nora "Shaffie" Shaffer. Ed once remembered his father as "most loving and most strict" and that he and Sam were instructed "never to do anything that would embarrass (their) sister." The boys were encouraged to work on farms and ranches in the summer, and Ann was responsible for hosting dinner guests at the home.

Right: Lloyd Noble as a high school freshman stands for a photograph with his parents, Samuel Roberts and Hattie Noble, and his sister, Mary Eva.



From Oil to Soil

In early adulthood, Noble taught school and served briefly during World War I before enrolling in the University of Oklahoma. Eager to begin his own venture, Noble left college early to seek his fortune in the state's most lucrative new enterprise — oil.

In 1921, the 24-year-old entrepreneur purchased his first drilling rig with assistance from his mother, Hattie, who co-signed a $15,000 loan. Noble became a leader in the oil and gas drilling industry, capitalizing on new ideas and technology to drill deeper and faster than his contemporaries. He quickly became one of the most respected drilling contractors in the U.S.

Noble found enjoyment in personal aviation and frequently flew from his home base in Ardmore to his oil rigs across the country. From this bird's-eye view, he could see that the poor agricultural practices he had observed as a youth were taking their toll on the land. Failure to return nutrients to the soil resulted in a barren land that was susceptible to erosion. Drought compounded the problem, and the winds that swept through the Great Plains in the 1930s carried off precious topsoil — blowing away the region's economic lifeblood.

During the Great Depression and Dust Bowl years, Noble saw that others were struggling. Many families fell into despair from the inability to grow food and earn a livelihood from the weakened land. Farmers gave up, leaving in droves to an elusive financial sanctuary in the American West.

WORLD WAR II EFFORT

After an impromptu meeting with an Englishman who showed up at the Noble home at 10 a.m., Sunday, Sept. 13, 1942, Lloyd Noble agreed to drill oil in Sherwood Forest to fuel British troops on the condition that Frank Porter, of Fain-Porter Drilling Company of Oklahoma City, would join him. The men forfeited any profit for their companies as a contribution to the war effort.

Above: Lloyd Noble and Art Olson (far right) went into the oil business together in 1921. Pictured is their first oil rig. The two operated together until 1930 then went on to achieve success in their individual drilling companies.

EARLY RANCH CONNECTION

As a junior in high school, Lloyd Noble decided to drop out of classes and move to the family ranch. He lived there alone for a year tending to cattle. It is said this was a time of self-reflection that greatly impacted him for the rest of his life.

Opposite page: Lloyd Noble (center) held a deep interest in the soil and how to improve its health for the benefit of farmers, ranchers and all of society.

Noble, who had at different times retreated to ranches for personal reflection and recreation, didn't see giving up on the land as the only option. He knew that the revitalization of his community must start with agriculture, and more specifically with rebuilding the soil. This would benefit not only farmers and ranchers but all of society.

The oilman once said: "We believe that while at times we have felt the overshadowing presence of oil, we are living in an area that is essentially agricultural. ... the land must continue to provide for our food, clothing and shelter long after the oil is gone."

Armed with this conviction, Noble focused his attention on bolstering land stewardship and soil management. In May 1943, he addressed these issues in a column for the 50th anniversary edition of his hometown newspaper. He wrote: "What are we in the present generation going to do with this heritage? Are we going to encourage the terracing, conservation and upbuilding of our soil so it will support a growing, healthy and prosperous livestock and agrarian industry, or are we going to allow our soils to be depleted and our population shifted to other areas as we read about it in the newspapers?"

Two years later, he provided a permanent resource for the agricultural community when he established Noble Research Institute (then called The Samuel Roberts Noble Foundation) on Sept. 19, 1945. He tasked his new organization with benefiting mankind.

In the early days, Noble's organization focused on education and encouraging area farmers and ranchers to return nutrients to the soil and to conserve resources. He continued to guide the organization until his death on Feb. 14, 1950, just three months after giving a speech in which he said: "No civilization has outlived the usefulness of its soils. When the soil is destroyed, the nation is gone."

Today, Noble Research Institute, guided in large part by Lloyd Noble's descendants, continues to build on its legacy of working alongside producers, providing research-based information and assisting them in the essential roles they play in society.

The mission is just as critical today as it was in 1945.

Who Was Lloyd Noble?

Full Name: Samuel Lloyd Noble

Born: Nov. 30, 1896

Parents: Samuel Roberts and Hattie (Skinner) Noble

Hair: Sandy curls

Eye color: Blue

Interests as a youth: Reading, history, debate

Employment: Delivery boy for Noble Brothers Hardware and J.A. Felker Grocery, janitor for First Christian Church, teacher in one-room schoolhouses, entrepreneurial oilman

Member of the First Presbyterian Church in Ardmore, favorite hymns included "Onward, Christian Soldiers," "Beautiful Isle of Somewhere," and "My Faith Looks Up to Thee"

Military service: U.S. Navy, spring to November 1918

Attended University of Oklahoma and later became a regent

Named southern Oklahoma's most useful citizen in 1948

Looking to the Future

Though the winds have settled from the Dust Bowl, there is still work to be done to restore the health and function of the land. Of the 655 million acres of public and private grazing lands in the U.S., it is estimated that up to 70% of them are in a degraded state.

This degradation does not only affect the individual producer's ability to grow food and earn a livelihood. It more broadly impairs the quality of food, interferes with fresh water supplies, increases the opportunity for land erosion, and limits the soil's ability to capture and store atmospheric carbon. However, there are ways to reverse this degradation for the benefit of both producers and all of society.

Noble today is developing programs to help ranchers regenerate their grazing lands and achieve long-term financial stability. Specifically, the future of Noble will focus on helping producers embrace and implement regenerative ranching, which is the process of restoring degraded soils by using practices based on ecological principles. Regenerative ranchers work with the natural environmental systems — comprising soil, plants, water, animals and the humans that manage them — to build organic matter and resilience within the soil.

Healthy soil has less nutrient run-off and erosion; sequesters atmospheric carbon, which combats climate variability; and, because of its ability to better hold water, serves as a management tool for both drought and heavy rain. Just a 1% increase in organic matter helps soil hold 20,000 gallons more water per acre.

"As we look to the future, we imagine our nation's cattle producers having the knowledge and tools needed to rebuild our country's soil and grazing lands, not only to provide for their families but pave the way for the next generation of producers," says Steve Rhines, president and CEO of Noble Research Institute. "While we absolutely support the continued delivery of nutritious and affordable food to the world's plates, our goal will be to help producers leave the land better at sunset than it was at sunrise. We are proud of our legacy and honored to have been entrusted to carry forward Mr. Noble's vision. It is what provides context and excitement for our next chapter of transformational work.

During this anniversary year, our celebration will focus on the important role farmers and ranchers play in our society, while we — as an organization — continue to grow and evolve to meet the challenges of tomorrow."

WHAT OTHERS HAD TO SAY

"... the outstanding characteristic of Lloyd was that he was strong in fundamentals. I mean in the things that really mattered, really counted. It wasn't whether you had a necktie or not; that wasn't his way of judging. His way of judging was how hard you worked, what you were ... decent character, honest and honorable person ... that's the way he judged people."

—Dow Hamm, oilman and university friend of Lloyd Noble, quoted in Imagination and Ability: The Life of Lloyd Noble *by Odie B. Faulk, et al.*

"Time after time Lloyd Noble expressed, with only a slight variation of the theme, that the best life was the one lived closest to the soil. ... (He believed) Topsoil could be reclaimed by proper utilization of known skills and those yet to be developed. ... Rebuilding land was a means of rebuilding people."

—Glen McGee, Lloyd Noble's minister, in a book manuscript (no date)

"In his mind, liberation from fear is the prime motive in the work of the (Noble) foundation. It is felt that development of natural resources will eliminate much of the fear that stalks the daily life of most men ..."

—Nancy Royal, in a 1948 Sooner Magazine *article about Lloyd Noble*

"No one can do more for our country than to provide jobs by which families can live comfortably and happily. That has been one of the uppermost thoughts in Mr. Noble's mind. He hasn't made a great display, but he has done much toward making this country a better place to live."

—P.G. Rawdon, Noble Drilling Company associate and original Noble Foundation trustee, in a speech given June 1, 1947

GUEST COLUMN:

THE GIFT OF A GARDEN CONTEST

College sweethearts competed in 1958 Noble garden contest before tragedy struck.

by Marjorie Moesel

I met my husband, Dick Moesel, in the Horticulture Club at Oklahoma State University in 1950. Dick was from Peekskill, New York, but he had wanted to live west of the Mississippi River — ever since he had seen the kindness of an Oklahoma farmer who offered watermelon to him and his fellow soldiers at a train stop in El Reno, Oklahoma, on their way home from the West Coast after serving in World War II.

We married in August 1952, and that same year he graduated with a horticulture degree. I graduated with a home economics education degree the following year. Dick went on to get his master's and was working on his doctoral degree, and so we moved across the country first to Ohio then New Jersey while he went to school and our family grew. Our son Rodd was born just a few months before Dick started his master's, and Eva was born in New Jersey.

In 1956, we learned of an opportunity to return to Oklahoma. An older couple in Pauls Valley was looking for someone to be there to take over when they couldn't run their operation anymore. Ultimately, we went into business doing horticulture on our own in Pauls Valley. We grew vegetables and herbs as well as flowers, berries, fruits, trees and shrubs.

In 1958, we got involved in a contest that the Noble Foundation (now Noble Research Institute) was sponsoring. Dick was always interested in helping other people learn how to do things better in growing plants, and our extension agent Cleo Stiles Brian thought we would be a good fit for the contest. We planted a number of different varieties of tomatoes, peppers, eggplants and so on that summer. We would also grow the plants in different ways — like staking some of the vining plants or growing them on the ground — and keep production records and different notes on the results. Then we had an open house for people from all over the state to come and see.

One day that fall, Dick was pulling some fence posts. He'd pulled quite a few without any problems, but one was in too hard. It turned the tractor upside down on him, trapping him underneath. The children and I were on our way home from a Bible study at church when Rodd noticed the tractor first. A friend was driving and as soon as she parked I ran toward it. Dick was alive but said to get a wrecker and an ambulance. I ran to the greenhouse to use the phone there.

Word gets around fast in a small town, and people started gathering. The wrecker went to pull the tractor off Dick, but it lurched. Everybody tried to hold it, but we couldn't. A lady who was a regular customer of ours was a Catholic nurse, and she was giving him the last rites. I didn't know what that meant at the time, but Dick said later that he did.

He was sent to Oklahoma City, and the children and I went with him in the ambulance. Rodd and Eva, 4 and 3 at the time, rode up front, and I rode in the back as Dick went in and out of consciousness. Those first couple of days, no one knew whether he would live or die.

When we got to the hospital, we found out Dick had several compound fractures in his arm and a number of broken ribs. We were fortunate. Later, he told us that when he was underneath the tractor, he felt like God spoke to him and said, "Don't move." The doctors told us if he had, he probably would have severed his jugular vein and died right there.

We were able to go home 30 days later, with Dick in a cast and unable to do much work for another several weeks. The post office had held our mail while we were in the hospital, so we decided to pick it up on our way home. Amongst the bills and letters, we had a note from the Noble Foundation saying we were the winners of the gardening competition. It was such a blessing! Our extension agent took us to the award ceremony, where we found out we were to receive a $500 bond that our bank proceeded to pay in full so we could use the funds right away. Noble was pretty important in our lives at that time.

We were fortunate that Dick was able to lead a long, productive life after that accident, but it was a very difficult time. However, I've often thought that sometimes the low spots in your life can also be the high spots. There are just so many blessings that can come out of bad things. We had wonderful neighbors and community who helped us after the accident, including the Noble organization. They did not know about our problems at the time we were selected as winners of the garden contest, but they made such a huge difference in our lives, and we were able to keep up a friendship after that.

I would like to say congratulations to Noble Research Institute as it celebrates its 75th anniversary. That is something to be very proud of. I would also like to say thank you. Noble is so good to give. They give by their teaching and their research. They're so important in doing research that helps us improve our practices so that we can do and have better than we've done and had before. I know they've been a big blessing not only to our family but to many other families as well.

Editor's Note: This column was written from an interview with Marjorie Moesel, which was recorded in fall 2018. It has been edited for space.

A woman stands in her garden, which she entered into Noble Research Institute's early soil and garden contest. The three-year contest, which started in 1946, aimed to generate interest in the organization's work to improve soil and boost productivity.

ONE BOLD STEP FOR NOBLE,

ONE GIANT LEAP

FOR REGENERATIVE RANCHING

Noble President and CEO Steve Rhines sits for an in-depth Q&A to discuss the organization's transition to regenerative ranching and what it means for the producers it serves and society at large.

DIRECTION OVER PERFECTION

A principles-driven journey for profitability and better land

In 75 years of building relationships with farmers and ranchers, we have found that most producers share the belief that each generation has an obligation to leave the land and its resources better than they found them. We also know they are motivated to build successful enterprises framed by profitability, growing family wealth, creating opportunities for successive generations, and providing a venue in which they can express creativity, develop mastery, live purposefully and retain independence. Regenerative ranching helps producers achieve these goals. Regenerative ranching is not a prescription. Instead, it recognizes that each family, ranch or farm, and landscape has its own unique characteristics, opportunities and challenges, and offers principles that transcend these factors. Success depends on the individual applying the principles to their specific operation, making management decisions that work with the natural processes taking place on the land and recognizing that the soil, water, air, plants, animals and people are all interconnected. Learn more at www.noble.org.

STEVE RHINES, PRESIDENT AND CEO

IN FEBRUARY 2021, Noble Research Institute announced that the 75-year-old agricultural research organization would focus all of its operations on regenerative ranching.

The decision naturally elicited a parade of elephant-sized questions, all interconnected, all equally critical. Farmers and ranchers, who have worked with Noble for generations, wanted to understand the definition, motivation and potential of this regenerative ranching mindset. Collaborators from universities, government agencies and the agriculture sector wanted to understand the broader implications.

Below, Noble President and CEO Steve Rhines walks us through the decision to harness Noble's passion and past for the singular purpose of assisting farmers and ranchers as they regenerate the land in a profitable manner.

Q: What is regenerative ranching?

At Noble, we have adopted the following definition for regenerative ranching: "the process of restoring degraded grazing lands using practices based on ecological principles." Admittedly, "ecological principles" may feel science-y and complicated, but many of us learned of the four ecosystem processes in school, including the water cycle, nutrient cycle, energy cycle and community dynamics. In practice, it is managing your grazing lands with grazing animals in a way that advances — rather than opposes — these important, natural processes.

Q: What do you hope to accomplish by focusing on regenerative ranching?

Noble's goal is to achieve regenerative land stewardship in grazing animal production with lasting producer profitability. Achievement will be measured by the nation's farmers and ranchers profitably regenerating hundreds of millions of acres of U.S. grazing lands.

Q: Why, as the largest nonprofit agricultural research organization in the country, did you decided to hone in on regenerative ranching?

The short answer is that we, as an organization, believe that regenerative agriculture helps producers meet two essential objectives: to be economically successful today AND to leave their lands better than they found them. If you look at a farmer or rancher's operation, they have to manage all pieces of the ecosystem — including soil, water, land, animal, markets and themselves. For the past three decades, we've been focusing on the individual pieces of that puzzle. Regenerative agriculture looks at how the whole system is managed, so our research will be at landscape-scale.

Q: So what's the longer answer? What brought you to this point?

In 2019, we began an organization-wide assessment to set a strategic direction and a common goal for the organization. As part of that work, we identified three primary challenges to future ranch viability: 1) land productivity and regeneration in the face of climate variability, 2) declining profitability and 3) declining population of agricultural producers.

It became clear that regenerative ranching is well-suited to address all three challenges as we look at the current and future generations of grazing animal producers.

We then evaluated these challenges through how our operations (i.e., producer consultation, producer education and research) could mitigate them. It was clear that we could only do that if we focused all of our energy on this singular goal: achieve regenerative land stewardship in grazing animal production with lasting producer profitability.

Allen Williams, Ph.D., of Understanding Ag shares his regenerative agriculture experience with Noble Research Institute employees.

Q: How does this regenerative focus align with your founder's intent?

This was the other critical component to Noble's move to a regenerative ranching focus. Regenerative ranching perfectly aligns with the mission and ethos established by our founder, Lloyd Noble. In a 1948 speech, occurring less than three years after our founding, Mr. Noble outlined that the organization was "intensely interested in the rebuilding and rehabilitation of the soil." Rebuilding and restoring the soil is at the heart of our mission and regenerative ranching.

Q: We've been working on soil health for decades. Isn't it already fixed?

There is as much need for rebuilding the soil today as there was when Mr. Noble founded this organization. Scientists and producers agree that our grazing lands are degraded, which results in a cycle of increasing inputs to achieve the same levels of production per acre. In addition, we see continued erosion and the loss of grazing lands to brush and woody encroachment. This has a tremendous negative impact on our landscape and becomes economically unsustainable.

Q: How is regenerative ranching different from land stewardship and soil conservation, or is it just another name for the same thing?

Land stewardship practices often focus on soil testing and applying necessary nutrients (such as nitrogen, phosphorus and potassium) to enable maximized plant yields. Often, the focus is on the plant, but the plant is only part of the story.

Likewise, soil conservation (and land stewardship), in its simplest form, seeks to reduce or prevent the physical loss of soil due to water and wind erosion. Again, this is only part of the overall equation.

Regenerative ranching is the next step in the land stewardship journey, wherein farmers and ranchers reduce their reliance on conventional practices and manage their operations to restore — or regenerate — the soil as a valuable component of a system that involves the dynamic interactions of soil, water, plant, animal, economics and the land manager.

Q: Does regenerative ranching work?

Yes, we have countless examples of regenerative ranching working across the United States. We understand that this evidence is anecdotal, but our research will answer critical producer-guided questions regarding soil management, grazing, economics and business operations.

A world-renowned regenerative scientist recently said: "An appropriate question is not whether regenerative agriculture works or not but how to make it work under a producer's specific context, including their land resources, economics, social and human circumstances." There are a lot of variables, but they are what ranchers face every day.

Our educational and consulting programs will be rooted in equipping farmers and ranchers to effectively use regenerative principles for their specific land and operation.

Q: How does Noble fit into the entire regenerative ranching process?

We want to help farmers and ranchers overcome the four key barriers that stand in the way of their lasting use of regenerative, profitable land management practices in grazing animal production.

Everything Noble does will build a farmer or rancher's knowledge, critical thinking skills, understanding and confidence in applying regenerative principles. We will be here when they need help or when they encounter something new.

Q: What are the barriers?

We group these barriers into four categories: lack of guidance and mentoring; economic uncertainty in adoption and operations as well as managing ongoing risk; cultural, generational and societal pressures that work against change; and lack of available, science-based management knowledge.

There are two parts to this last one. First, we need to answer the right questions to benefit farmers and ranchers, which will also benefit the scientific community. Second, we need to make research results (whether provided by Noble or others) accessible and usable by farmers and ranchers.

In the end, we are dedicating all of our operations, including research, consultation, producer education and our ranches, to helping break down these barriers.

Cattle graze on a ranch near Boswell, Oklahoma, on Oct. 22, 2020.

Q: Why specifically focus on grazing lands?

Grazing is the single largest use of land in the United States. There are 655 million acres of public and private grazing lands, which represent almost 41% of our nation's land. Grazing lands exist in all 50 states, and the majority of this land cannot sustain row crops. It is reported that up to 70% of the world's grazing lands are in a degraded state. And, research in grazing lands is often overlooked.

Q: What are the outcomes of degraded soils?

Degradation negatively impacts the land's productivity. In an effort to maintain productivity, we often seek to add more and more inputs to "control" weeds and increase production. These inputs are often expensive and require time and equipment to apply. That is only one side of it. Degraded lands rarely receive the full benefit of rain or applied water because the land is often bare, hardened, and tends to allow water to move across the surface to tributaries or other bodies of water. We often see degraded lands being more susceptible to wind and water erosion.

Q: How is Noble going to help producers with degraded soils?

We are here to help farmers and ranchers improve degraded soils and the economics of their operations. It is not just about reducing inputs. Rather, it is holistically managing an operation — soil, forages, animals, water, economics, and human effort and time — to benefit both the soil and the economics. Through this approach, we first look to build soil health. We do this by covering the ground with growing plants, we rely on a diversity of grazing plants, we keep living plants present year-round, we avoid depending on regular and significant disruptions to the soil (e.g., fertilizer, tillage), and we integrate managed grazing into our system. Healthy soils tend to stay in place, increase water availability for forages, and serve as a reservoir of nutrients for plants.

The outcomes of regenerative ranching sound great, but it differs from traditional management of livestock and pastures. Change in practice can be hard — particularly if you are depending on your farm or ranch for your livelihood. Accordingly, Noble is dedicated to assisting farmers and ranchers in building knowledge, skills, and confidence in adopting and sustainably applying regenerative principles to their own operations.

Q: What are the benefits of regenerative ranching?

Properly managed soil leads to increased soil organic matter, which reduces soil erosion, holds water to sustain through periods of drought and to mitigate impacts of heavy rainfall, enables productive plant growth, requires less fertilizer and other inputs, enhances water quality, and sequesters atmospheric carbon. Less fertilizer and inputs can significantly impact the profitability of an agricultural operation.

At scale, we begin to sequester atmospheric carbon and manage one

QUESTION:

Why specifically focus on grazing lands?

Grazing is the No. 1 use of land in the U.S., and beef cattle have been a primary focus on Noble's research and consultation for the past 75 years.

655 MILLION ACRES OF PUBLIC AND PRIVATE GRAZING LANDS

which represent almost 41% of our nation's land. Grazing lands exist in all 50 states.

LIVESTOCK PLAY A CRUCIAL ROLE IN NOT ONLY MAINTAINING BUT REGENERATING ECOSYSTEM HEALTH WHEN MANAGED PROPERLY.

"HEALTHY SOILS PROVIDE THE FORAGE THAT I NEED TO RAISE HEALTHY CATTLE.

I only have so much land to work with, and I want to be able to improve what land we have."

▸ RUSTY DANIEL, WAPANUCKA, OK

85% OF U.S. GRAZING LANDS CANNOT SUSTAIN ROW CROPS

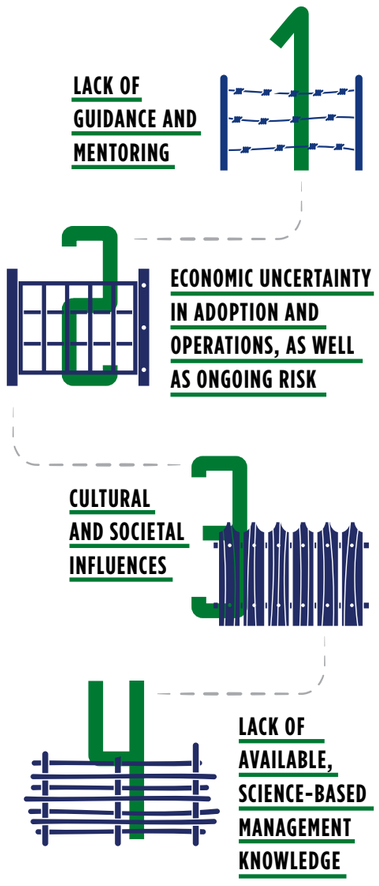
IT IS REPORTED THAT UP TO 70% OF THE WORLD'S GRAZING LANDS ARE IN A DEGRADED STATE.

Land that is degraded is often bare, hardened, low in nutrients, and tends to allow water to move across the surface.

QUESTION:

What are the barriers to regenerative ranching?

The regenerative journey may seem uncertain and paved with risk at first. It is a divergence from tradition, which means you may not know many on the path, at least not early on. However, farmers and ranchers across the U.S. are finding innovative ways to overcome the barriers and find success. Noble Research Institute's aim is to help farmers and ranchers overcome these barriers.



of the variables often cited for climate variability. We impact water quantity, water quality and nutrient runoff. We create landscapes that serve as the center of rural renewal. And, we impact the profitability and ability for farmers and ranchers to continue raising the world's protein needs.

Q: How does regenerative ranching impact wildlife?

A landscape comprised of diverse plant life increases opportunities and habitats for wildlife and pollinators. Diversity above ground correlates to diversity below ground, which provides an environment conducive for above-ground plant growth.

Q: What role do grazing animals play in regenerative ranching?

The introduction of managed grazing animals stimulates plant growth, recycles nutrients to the soil, and enables the energy of the sun to be converted into a nutrient-packed protein source for human consumption via plants that are otherwise inedible by humans.

Q: What are the costs associated with shifting to regenerative ranching?

There is no one-size-fits-all answer to this question. Instead, the answer typically depends on what you're trying to do, how fast you're trying to do it and the resources you have available to get you there.

We teach principles — soil management principles, economic principles and grazing principles — not "a solution in a bag." We offer context on application of such principles, then producers have to decide what that might look like in their context. But, Noble walks alongside the producers for that part of the journey as well.

We know that economics is at the top of the list of questions for farmers and ranchers considering regenerative production systems. As we transition the Noble ranches (about 14,000 acres), we will be tracking infrastructure (water, fencing, etc.) and expenses for new enterprises (adding sheep, goats, etc.) as well as vetting alternative approaches, for example, portable water troughs utilizing quick-connect adaptors along water lines versus stationary troughs. Then we will make our budgets and expenses available for review by farmers and ranchers as part of our educational and learning process.

Q: Is regenerative ranching a profitable way to manage the land?

The American landscape is dotted with financially sound regenerative farmers and ranchers. Can they explain their success scientifically? Not always. Does that mean, then, that success hasn't happened? Absolutely not. We can visit many of these farms and ranches and see diverse pastures — not five different forage species but 50 or more different species. We see pollinators and wildlife activity. We see increased soil organic matter and increased water holding capacity in the soil. We can find healthy and marketable ruminants — from cattle to sheep and goats. We see reduced fertilizer and other input costs, which results in increased profitability. In addition, we see new marketing opportunities, which offers alternatives to commodity food production, which allows farmers and ranchers to participate in specialized markets to satisfy a growing desire for locally sourced food.

As mentioned before, understanding the economics is critically important. Exploring different markets and helping navigate the risk associated with change is a place Noble can assist. It will be a primary focal point of our research and education activities.

Q: How does a producer know this isn't just another short-lived trend?

With regard to the issue of trends, in 1945, Mr. Noble envisioned our organization to work to repair and build up the soil and at the same time provide practical and economically beneficial information to agricultural producers.

The six principles of soil health are a cornerstone of regenerative ranching. Soil health can be evaluated in the field by noticing color, biological activity, structure, rooting resistance and smell.

On a national scale, it is arguable that the need has never been greater to restore our soil and better ensure the economic viability of the less than 2% of the U.S. population that grows food for a hungry globe.

Q: Is there research to back up the claims on regenerative ranching?

There is a growing body of reported research. There are a number of names — which I cannot do justice to in this answer alone — who have been speaking about and sharing the impact of regenerative ranching through peer-reviewed research and presentations for years (even decades). A few of these names include Hannah Gosnell, Laura Paine, Rattan Lal, Jason Rowntree and Richard Teague. Noble seeks to contribute to this research and share its results broadly.

Q: What does regenerative ranching look like in application?

It looks like what the farmers and ranchers implementing the principles want it to look like. It might mean smaller framed cattle, but maybe not. It may include use of electric fence dividing larger pastures into smaller grazing paddocks, but maybe not. It may involve multispecies grazing (cattle plus sheep or goats), but maybe not. It may look like multiple enterprises per acre to offer economic diversity to the operation, but maybe not.

No matter what the specific operation may look like, we are working toward operations that are regenerating their grazing lands and at the same time providing lasting producer profitability.

Q: Does moving to regenerative agriculture mean abandoning conventional agriculture as it is currently known?

In the text *Tools to Manage Ecosystem Processes*, the Savory Institute says it best: "When managing holistically, tools are neither good nor bad, and no judgment on the use of any tool or any action should be made outside the context of the whole under management." The text goes on to say: "The way a tool is used can make as much of a difference as whether its use is appropriate."

Regenerative ranching is not anti-technology or anti-anything. Pesticides, herbicides, fertilizer, fire and grazing are all tools that may be employed for land or forage management. Rather, regenerative ranching is balancing the place for any such tools, technologies or management practices based on observation and need.

In visiting with long-term regenerative farmers and ranchers, once ecosystems are healthy and functioning, the "chemotherapy" needed to drive yield and production is often displaced by natural interactions and processes.

Q: What about the way we market our livestock? Does it mean we won't be selling through the sale barn or to feedyards?

The first question would be "What does the farmer or rancher want?" Regenerative ranching does not dictate a point of sale or prescribe a singular marketing option. Producers may market their livestock through traditional channels, for example, sale barns, or transfer them to feedyards. Others may seek to distinguish their animals from commodity channels, for example, by selling as pasture-raised harvesting and selling directly to consumers.

Q: I am interested but not sure of where to begin. How do I get started?

Contact Noble Research Institute at 580-224-6500.

BREAKING BARRIERS

TO REGENERATIVE AGRICULTURE

It's not easy to step out of tradition or begin a new venture. For these farmers and ranchers, improving the long-term health of the land and their finances were worth the challenges.

BY COURTNEY LEEPER

THE NEED

Alternatives to conventional agriculture are becoming increasingly important with farm debt at an all-time high and land productivity declining in the face of climate variability. Of the approximately 655 million acres of grazing lands in the U.S., an estimated 70% of them are in a degraded state. It is not enough to simply sustain the system. The land must be regenerated.

TALK TO A RANCHER who has been practicing regenerative agriculture for the past 20 years, and you're likely to hear about the resounding benefits.

Increasing soil organic matter — the foundation of soil fertility — improves the land's natural ability to produce food and fiber and to provide important services to society, like air and water filtration.

Better functioning, well-managed land grows more forage for cattle and other grazing animals. It stays resilient during times of drought and heavy rains due to the soil soaking in and holding more water. It doesn't typically need costly inputs to control brush and other pests or to boost fertility. And the combination of cutting expenses, financial planning and, in many cases, new marketing opportunities, adds profitability and overall stability to the operation.

Talk a little more with that same producer, and they will reveal the journey requires grit, education and adaptation.

Tony Malmberg ranches in the Blue Mountains of northeastern Oregon.

Barriers to Regenerative Agriculture

Hannah Gosnell, Ph.D., has talked to hundreds of farmers and ranchers who use grazing to reverse degradation on both public and private lands in the U.S. as well as in Australia. It's a cause she believes is becoming increasingly relevant, considering as much as 70% of U.S. grazing lands are considered degraded and scientists are realizing agriculture can be a natural climate solution.

In the mid-2000s, Gosnell, now a professor of geography at Oregon State University, set out to learn more about how cattle producers can play a role in climate change mitigation. She interviewed nearly 30 of the approximately 1,000 ranchers who signed up to participate in a voluntary carbon market that paid land managers for sequestering carbon after going through a verification process. The program was in place from 2008 to 2010.

It quickly became apparent to Gosnell that those who participated were already managing in a way that fit the program's requirements.

"... [T]hese climate-resilient practices ... gave them more forage, cost them less, and created less stress for them and their livestock."

—HANNAH GOSNELL, PH.D.

"They weren't doing it just to make money from the program," Gosnell says. "They did it because it made sense for them. They were already engaged in these climate-resilient practices that gave them more forage, cost them less, and created less stress for them and their livestock. The payment was just icing on the cake."

So if regenerative agriculture has so many positive outcomes, why is it not more widely adopted?

The short answer: Historical factors have shaped the current conventions of agriculture, and the reality is it's not easy to step away from them.

Gosnell's research turned to focus on what she calls the "transformation journey."

"I would ask people, 'How did you decide to go from conventional to regenerative and what was the journey like?'" she says.

What she found was that there are practical, political and personal challenges involved in the transition.

From a practical point of view, it takes time and resources to learn new management techniques as well as how and when to apply them based on the ecosystem processes taking place on their land. These processes (the water, energy and nutrient cycles in addition to community dynamics) manifest and react differently to different practices depending on where you live and what the weather is doing. Managers invest in additional education and, often, infrastructure, and they must learn to see the land differently.

Regenerative producers must also spend the necessary time planning, monitoring and adjusting plans accordingly.

As with any enterprise, there is always a level of economic uncertainty.

According to Gosnell, the most difficult challenge, and most interesting, falls into what she calls the personal, or social, sphere. If a person has been ranching a certain way their whole life, and everyone in their community does it that way, and their dad and granddad did it that way, it takes tremendous courage to shift one's mindset and chart a new path.

The following producers undertook the transformative journey of regenerative agriculture and overcame the barriers to adoption. For some, the journey began with crisis. For others, it started with the desire to look at agriculture through an entirely new lens.

Tony Malmberg

LOCATION: Blue Mountains of northeastern Oregon

CURRENT OPERATIONS: Raises beef cattle on native range and introduced pasture managed for biodiversity

Tony Malmberg grew up on ranches in the Nebraska Sandhills under the tutelage of his father, uncle and grandfather, a Swedish immigrant whose third language was English. Sioux was his second, picked up during his younger years with the Native American cowboys on the Matador Ranch in western South Dakota.

Grit and determination were woven into the fiber of everything Malmberg was taught as a cowboy, he says, but hard work alone was not enough to save his ranch.

He and his family had bought and moved to a property in Lander, Wyoming, in the fall of 1978. Within the first few years, his dad died. His uncle left, he and his wife divorced, and he was faced with bankruptcy.

For years, Malmberg blamed the weather, markets and regulations for his troubles. Then, slowly, he began to recognize the way he was ranching simply wasn't working anymore.

In the early 1980s, he began to hear rumblings of a Zimbabwean ecologist, Allan Savory, who had come to the U.S. a few years before. Savory claimed his method of ranching could double a ranch's stocking rate. It was a controversial assertion but one Malmberg, who wanted to increase production, found attractive.

In 1987, Malmberg decided to take one of Savory's classes on holistic management. He remembers taking away three things: knowledge of a gross profit analysis and of overgrazing and, per-

haps most significantly, "that there was such a thing as having a quality of life."

Malmberg learned that grasslands like the ones he managed evolved under large herds of grazing animals that stayed together to protect themselves from packs of predators. If he wanted those grasslands to perform, he needed to mimic nature and manage them in the way they evolved — with intense periods of grazing followed by long periods of rest. Proper grazing creates a positive disturbance on the landscape, and manure leaves behind slow-releasing nutrients that feed microbes in the soil. However, the proper balance is essential. A plant needs to recover before it's grazed again, otherwise it slowly weakens and dies.

When Malmberg came home to the ranch, it was as if he was seeing the land for the first time. He started noticing bare ground, plant diversity and overgrazing. For the first two years, he didn't change anything. Instead, he spent a lot of time walking the land, looking at the ground and rolling up fences he didn't think necessary anymore.

He also spent time setting a plan.

He, his four full-time employees, and, during the summer, his brother and three sisters were running 600 cows and 600 yearlings in about four pastures based on the age and sex of animal.

In a region that receives only about 8.5 inches of rainfall per year, that meant expansive pastures that took days to cross in order to check all of the cattle.

Based on what he learned about needing to use both grazing and rest on the land, he started planning his grazing to adapt to plant growth rates, residual cover and, most importantly, plant recovery periods. He wanted to prevent overgrazing and realized he could do this best by concentrating his cattle in smaller pastures and moving those cattle to fresh grass frequently. His first step was to develop more water systems to accommodate two large herds that would graze smaller sections of land at a time. In the third year, he started consolidating his cattle.

By that point, he and his crew were going around 6 miles of fence at a time instead of 100. His neighbors thought he was crazy and some even thought he was overgrazing (the opposite of what he was doing), but Malmberg started seeing results. More forage was growing, and, by the fifth year, desirable bunchgrass species were reappearing. He was able to increase stocking rates, and his animals weren't getting sick as often.

"That was pretty reinforcing to me that you could see what was going on," Malmberg says. "You could see improvement. You could see animal health improving. That kept you going even though your peers were not very supportive and not a lot of people around were doing this."

At the height of his operation in Wyoming, he was running 1,200 cow-calf pairs and 1,000 yearlings on about 60,000 acres with two-and-a-half full-time employees. He had gone from a rate of 5 stock days per acre to 10 while becoming an epicenter, often studied by University of Wyoming, for the endangered sage grouse. In the late 2000s, he and Andrea Malmberg, his wife, moved to northeastern Oregon and began using cattle to improve habitat for salmon. On the first of their two ranches there, they have been able to go from 130 stock days per acre to 250 due to improvements in soil health.

"With the sage grouse and the salmon, I've never seen a situation yet when cattle didn't benefit from the improvement of the sage grouse or salmon habitat," Malmberg says.

The hardest part for him, Malmberg says, was stepping away from traditional practices.

"It feels like you're dishonoring your ancestors, and it acknowledges you were wrong," he says. "I've learned to deal with that by recognizing that we didn't know some of these things before.

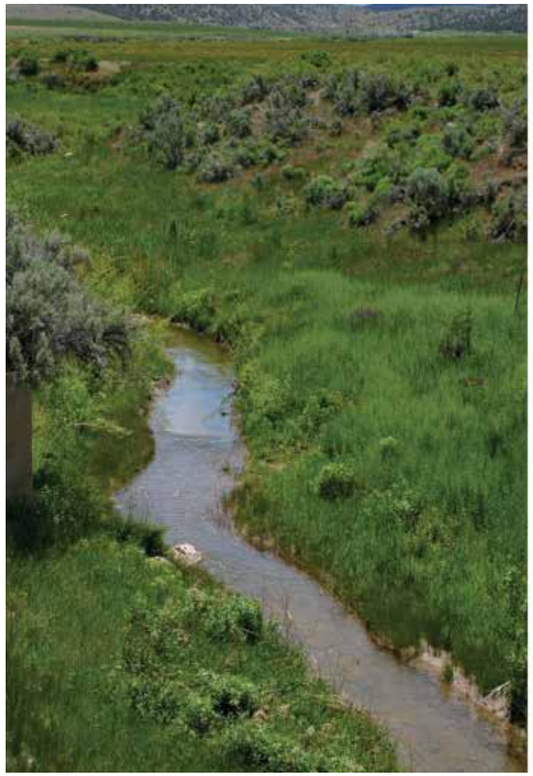
What is Holistic Management?

Regenerative ranching is often associated with holistic management, which is the decision-making framework that Allan Savory developed beginning in the 1960s.

In simplified terms, holistic management is a mindset that requires you to recognize that nature is made up of various interconnected parts and that a land manager's personal and economic well-being is tied to the health of the land. Essentially, land managers make decisions that take into consideration the short- and long-term effects on ecology, profits and humans. Holistic management also emphasizes an understanding of ecosystem processes, such as the water and mineral cycles, energy flow, and community dynamics.

The framework asks producers to define their operation, including who is responsible for making decisions and what resources they have available. Then they must articulate their "holistic context," which is essentially their goals and vision for what they want their life to look like as well as what they want for the land hundreds of years into the future. Practitioners run every decision through a series of checks to see if a particular action is aligned with their "context." Then they continually monitor their ecology, profits and social factors, and adapt in ways that keep them moving toward their goal.

To learn more, go to savory.global or holisticmanagement.org.



Tony and Andrea Malmberg moved from a ranch in Wyoming to begin an operation in northwestern Oregon in the late 2000s. Tony established holistic management on their ranch in Wyoming as well as on a ranch near Belle Fourche, South Dakota (top), for which he consulted several years. Thanks to regenerating the land, the Malmbergs benefited from greater forage production and water quality (left) compared to adjacent, conventionally managed land (right). Pictured is Twin Creek, near Lander, Wyoming.

My grandfather and father and uncle didn't have a way to think about how the grasslands evolved."

He adds that it's important to learn how the ecosystem processes work and to trust them, recognizing it will take time to turn them around. Ultimately, however, it takes an openness to know your situation and to make the changes that will get you to where you want to be.

"With new knowledge and new understanding and a changing context (personal situation, finances, knowledge, people skills, rainfall patterns, etc.), we also need to change," he says. "You can't just do the same thing every day, every week, every month, every year, and expect to get different results."

Chad and Rhona Lemke

LOCATION: Northwest Texas Hill Country

OPERATIONS: Raises beef cattle, sheep, goats and hogs on native range

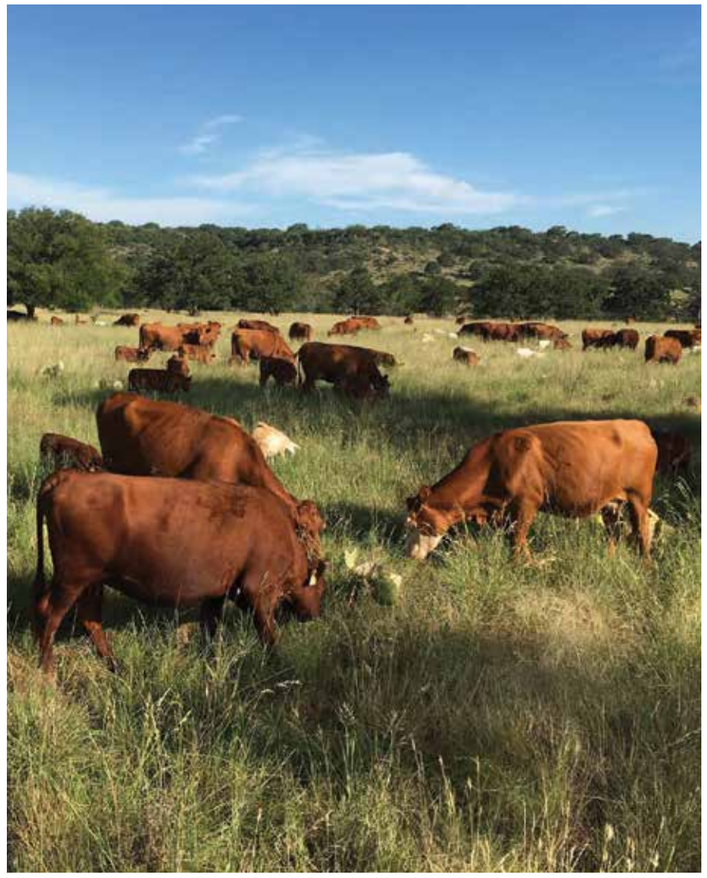
In the early 2000s, Chad and Rhona Lemke were living in San Antonio when they decided it was time to pack up their four young daughters and move to the family ranch in the northwest Texas Hill Country.

Though the couple met in the city, they held shared experiences of country life. Rhona's father owned a ranch outside their small town south of San Antonio, where they spent their weekends. Chad had worked summers and holidays on his family's ranch near Mason, Texas, where his grandparents and great-grandparents lived.

They wanted to raise their family in the country, but they noticed many of their country friends were moving to the city. When they asked why, they were told you couldn't make a living ranching anymore.

It was an odd thought to the Lemkes, who questioned how an ancient lifestyle could be made nonviable in the past 50 years. They decided that if the conventional methods they had grown up with weren't profitable anymore, they would just have to find a different way.

When they were given the opportunity to take over management of the



Chad and Rhona Lemke have diversified the type of livestock they graze on their family ranch in Texas as part of their program to improve soil health and overall land function.

From left: Rhona and Chad Lemke ranch in the Northwest Texas Hill Country. Some of the land they manage has been in the family since 1895.

family ranch in Mason, some of which has been in the family since 1895, they dug into their record books and found an unfortunate story.

"Our family managed well, given what they had, but we know through data that was shared throughout multiple generations that all of the natural systems were going downhill," Chad says.

Though the family rotated their cattle through four or five pastures, those pastures were large and overgrazed. In an environment where you may get 40 inches of rain one year and 15 in the next, running out of grass became a real problem with no plan. When it was gone, supplemental hay was fed to the cows.

As the Lemkes sorted through numbers and looked out on the land, they could see it was supporting fewer animals and more invasive species. They started looking into ways to reverse this degradation.

"We knew we wanted to work with nature, not against it," says Chad, adding that they wanted to foster the microbiology in the soil in part by cutting back on chemicals being used to control plant species considered weeds. "We wanted to manage for what we wanted, not against what we didn't want."

Chad, who had helped build a landscaping business in San Antonio, was familiar with biological products and methods for growing grass to cut. The Lemkes decided they would apply some of these same approaches on a much larger scale on the ranch.

Though both Chad and Rhona knew the basics of ranching from their early years, they are quick to say they were not ranch kids and had a lot to learn in those first few years. Much of what they needed to figure out was what exactly they needed to learn and who they wanted to learn from.

"That was a huge challenge," Rhona says. "There is so much information out there that you can just drown in information and still not know where to go."

Ten people may say 10 different things, she adds. However, once they figured out their goals, they were able to narrow that advice down further to

What Is Regenerative Agriculture?

Regenerative agriculture is the process of restoring degraded soils using practices based on ecological principles. Noble Research Institute's focus is on restoring degrading grazing lands, or regenerative ranching.

In general, regenerative agriculture and ranching promotes:

- Building soil organic matter and biodiversity.
- Healthier and more productive soil that is drought- and flood-resilient.
- Decreased use of chemical inputs and subsequent pollution.
- Cleaner air and water.
- Enhanced wildlife habitat.
- Capturing carbon in the soil to combat climate variability.

To learn more, go to www.noble.org/direction-over-perfection

From left: Andrea Todt and Cody Hopkins raise beef cattle, chickens and turkeys on pasture land in the Ozark Mountains of north-central Arkansas. Using a combination of animals in planned rotations of grazing and rest across the land has helped boost soil organic matter, biodiversity and overall productivity. They started Grass Roots Farmers' Cooperative in 2014 to help bring more economic stability to other farmers and ranchers like themselves on the regenerative journey.

what might work for them and, as Chad says, they were not afraid to try anything.

They recognized early on that they would need mentorship, which they found first through a holistic management course and later through networks of other producers following the same framework. Today, after more than 20 years of experimentation rooted in regularly moving animals to fresh ground in order to build up the soil, the Lemkes feel they are in a place where they can help others. They, with another couple, lead the Grassfed Sustainability Group, which is a network of Texas producers affiliated with the Savory Institute.

They have been able to triple their forage production and stocking rate, increase biodiversity, improve their soil's water-holding capacity, decrease erosion, increase wildlife, and reduce invasive species. Now their goal is to help others get there without making all of the same mistakes they did, Rhona says.

There are others out there who have been on the regenerative journey for decades and are willing to share their experiences, according to Chad. There has only been one problem.

"One of the beauties of agriculture is we're fiercely independent people," he says, pausing a moment. "And one of the drawbacks is we're fiercely independent people."

At times it has been difficult to find others on the path, but this is changing. Networks are popping up, and the internet and social media have made that even easier. Now farmers and ranchers just have to be willing to reach out for help.

It's important to find people who are actually doing regenerative agriculture and to remember that what works in one area may not work in another.

"Every environment, every ecosystem, functions differently," Chad says, "but principles hold true. So once you learn those principles and begin to implement, understand and see them in your own operation, that will help you do better long-term."

Cody Hopkins

LOCATION: Ozark Mountains of north-central Arkansas

OPERATIONS: Raises beef cattle, chickens and turkeys on introduced pasture managed for biodiversity and pigs in the forest

Cody Hopkins grew up on 40 acres in rural western Arkansas, but he wouldn't call it a working farm. He also wouldn't call the region brimming with economic opportunities.

Hopkins got out of town and, in 2001, became the first in his immediate family to graduate college. The physics major headed to the East Coast to teach, but after a couple years he was ready to be closer to home.

He wasn't sure what he would do for work, a problem he realized wasn't unique to him in his home community. He did know he liked food, and he was concerned about environmental problems connected to poor agricultural practices.

In 2006, he and Andrea Todt, his wife, decided they wanted to start a farm that would reflect their values around healthy living, proper stewardship of the environment, respecting animals and creating economic opportunities in their community.

They had no land or experience to draw from, only big dreams and a realization they were going to need help.

From the beginning, they knew they wanted to market directly to consumers. There was too much uncertainty in the commodity market, especially for an operation of their size. An elderly neighbor was allowing them to use her 40 acres in exchange for the free fertilization their animals would provide.

On 40 acres, they knew they would need more than just cattle to make ends meet. They had seen other farmers using chickens in complement with cattle to improve soil health and decided that would pencil out for them.

The Four Ecosystem Processes

WATER CYCLE: The amount of water on Earth is finite, and it cycles through evaporation, transpiration and precipitation. One of the ways that water moves through the cycle is through its ability to permeate the soil.

NUTRIENT CYCLE: In this system, energy and water are transferred between living organisms and the non-living parts of the environment. Frequent disturbances, such as grazing, help to maintain the above ground nutrient cycle. Biotic activity such as earthworms, insects and microbes in the soil, further improve the nutrient cycle. An optimal nutrient cycle depends upon good plant diversity and soil cover.

ENERGY CYCLE: It all begins with the sun. Plant leaves are the solar panels that drive the energy cycle. The energy cycle functions optimally when plants are allowed adequate recovery from grazing.

COMMUNITY DYNAMICS: Community dynamics are the changes to community structure and composition over time, including changes in microbiology, plant and animal life.

Cattle graze in north-central Arkansas on the farm of Cody Hopkins and Andrea Todt.

But even before they purchased any animals, they started their research. First by reaching out to other producers then by joining different small groups. They attended conferences, read lots of books then learned hands-on through experimentation on their farm.

"We knew we had a lot to learn and we were just aggressive in going out and doing that," Hopkins says, adding that their ability to throw themselves all-in and to live simply while building their business gave them an advantage over someone trying to make the switch mid-career.

Their greatest challenge was lack of infrastructure. Though restaurants and families in the Little Rock area were hungry for meat from the pasture-based livestock they were raising, they had difficulty finding processors that were inspected by the U.S. Department of Agriculture, a requirement for all meat sold commercially in the U.S. Once the meat was harvested, they also needed to find enough freezer space to store it safely. And then there were questions like, "What if customers only want tenderloin and I can't get the ground beef sold?" and "What if no one wants to buy the bones or the oxtails?"

At first, they did all of their own marketing, processed chickens on-farm, managed their relationship with the processor directly, and managed their own inventory, with help from a growing team of employees from the community.

"There was a pretty serious learning curve of trying to be a vertically integrated business on a small scale," Hopkins says. "You're not just a farmer, you're a marketer, an inventory manager, a human resources director and an accountant."

Still, they were growing and seeing improvements on the land. Within three years, they had grown beyond the 40 acres and moved on to bigger pastures. Today, they manage about 350 acres, continually refining their practices.

Cattle are moved to fresh pasture every day, typically twice in the growing season. The chickens and turkeys pass over a different piece of ground each day, making one full rotation each year. And the pigs, which forage primarily in the forest, are rotated every five to 14 days, depending on size.

One piece of pasture may rest for two to four months, depending on time of year, which, combined with the "dance" of moving animals, increases fertility and allows roots and forage a chance to regrow. Annual grasses are also interseeded behind the chickens and pigs to add even more biodiversity and nutrition for the cattle. They have seen pastures that started out with 1.5% organic matter shoot to 3.5-4%.

A 1% increase in soil organic matter can hold about 20,000 gallons of additional water per acre.

Land that is able to capture and retain more rainfall is more resilient during times of drought and flood.

"That's been a huge win for us," Hopkins says. "Our pastures stay greener longer into the winter and into drought. They're more productive. They have more diversity. I think that's a testament to the overall way we farm. There's not one silver bullet. It's the rotation of the animals and the mix of the animals. If we were just doing cattle, it would be difficult to do what we're trying to do here in the Ozarks."

The economics of farming and rural life remains a challenge. Hopkins is continually evaluating. In 2014, he and Todt started Grass Roots Farmers' Cooperative with a small group of like-minded farmers and in partnership with Heifer International, an Arkansas-based nonprofit that helps smallholder farmers across the world. One of their goals was to help bring more economic stability to their farm and to others like them. Grass Roots does so in part by helping to reduce complexity in the business, which Hopkins describes as a hindrance to both efficiency and quality of life. In 2020, the cooperative bought from nearly 40 farms and ranches from Arkansas, Missouri, Kansas, Texas, Kentucky, North Carolina, Nevada and Oregon.

Now Todt focuses on managing the day-to-day farm production while the cooperative, run by Hopkins and a staff of 12 others, handles the logistics that go into getting meat from farm to consumer, from processing to marketing and delivery. The cooperative also provides on-farm support to help producers improve their practices, grow their operations, and coordinate other logistics to ensure production meets demand and that they have everything they need to do so.

"We were basically building a business from scratch (when we started our farm)," Hopkins says. "You've got to learn how to run that business and you've got to be willing to figure out how to make ends meet while you're trying to figure out how to get the business off the ground where it can contribute to your livelihood. That is one thing we try to focus on now. We want to help accelerate that for folks who join our coop."

Breaking Barriers

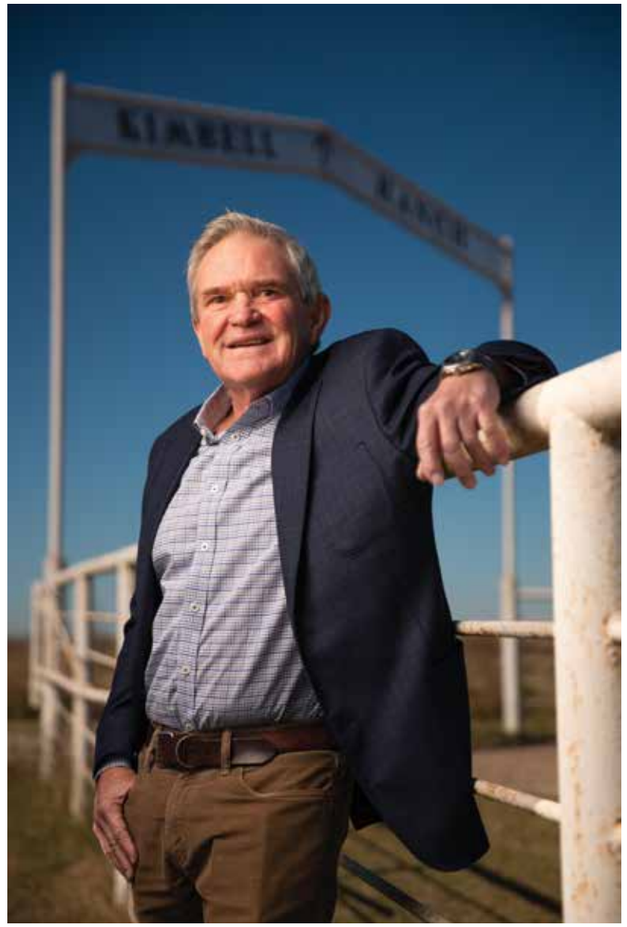
Noble Research Institute recognizes the task at hand is not easy and aims to remove, mitigate or help ranchers avoid the barriers that deter them from adopting long-term regenerative, profitable land management practices in grazing animal production.

Noble aims to help grazing animal producers overcome the following barriers to regenerative ranching:

- Lack of guides and mentors.
- Economic uncertainty in adoption and operations as well as ongoing risk.
- Cultural/societal influences.
- Lack of available, science-based management knowledge.

Q AND A

Ranchers who have worked with Noble through the years share their experiences.



STAN KIMBELL

Wichita Falls, Texas
Worked with Noble since 1982

How has Noble helped you?
The consultants helped me develop goals and objectives for each of our family properties in Texas and Oklahoma. I felt having their input on everything from soils and crops to livestock and economics was a balanced approach, and I still look back on some of the summaries they have sent me through the years from our visits.

What do you enjoy most about working with Noble?
The relationships with the consultants. I have been fortunate to have worked with such talented people in the past 38 years. Noble Research Institute is a valuable resource, and it has been a blessing to have the knowledge and advice to help me along the way to reach my operational goals.

ERIKA HALLOCK

Savory, Texas
Worked with Noble since 2020

What have you learned from Noble?
While formulating a wildlife exemption plan, we learned how to make a habitat for wildlife by cutting down trees and making Eastern bluebird boxes. We learned the differences in grass seeds and which ones were the best for us to plant. We had no idea that a subject like grass seed could be so complex.

What are your initial impressions of the organization?
A consultant has helped us develop our initial plan and has been there to answer questions along the way. It is so nice to have such a great resource.

BRENT AND SHERI KUEHNY

Elmore City, Oklahoma
Worked with Noble since early 2000s

What makes Noble unique to you?
Its ability to be an evolving resource is most beneficial to our operation. Noble is the best bridge we have found between academia, new technology and practicality, which is hard to come by.

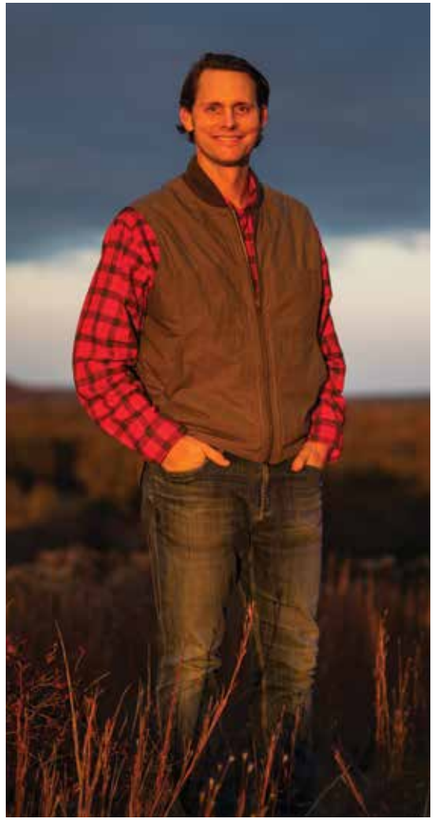
What do you appreciate most?
Each consultant's personal agricultural background and passion for the industry has always shown their ability to understand where our questions and concerns come from. The research projects and educational programs come from day-to-day real life situations and scenarios that producers face. We are able to apply different things from these programs to our individual operation.

PRESTON SMITH

Stuart, Oklahoma
Worked with Noble since 2013

What is the greatest lesson you have learned from Noble?
Noble expanded my perspective on grazing animals and not just how to increase profitability but how they can serve as a tremendous tool for stewardship, which is paramount to the legacy we are trying to leave on our property.

How would you describe Noble to someone else?
I believe two are better than one, and at Noble you get a whole lot more than just two. They have teams of educators, researchers and producers with decades of experience who have helped us navigate some complex problems. Considering all that comes with the ease of talking with an old friend, I highly recommend working with them.



JAN LEE

Boswell, Oklahoma
Worked with Noble since 2000

What is the best piece of advice you've received from Noble?
The advice was a question: "What are your goals?" It was one of the first questions they asked me. This was important to know in order to help me obtain my dream of becoming a farmer focused on pasture and range.

What would you tell others about Noble?
This organization is top notch. They are there to help you become a better manager. Their information has been priceless to me.

This page: Tim Jones and Chie Morizuka look over their new Gladney Farm at Toei in the northern prefecture of Hokkaido, Japan. The couple, who moved to Japan to be closer to Morizuka's family, raise Angus and practice regenerative agriculture using principles they learned from Noble Research Institute consultants.

Opposite page: Tim Jones (pictured) and Chie Morizuka examine their soils and plants using sight, smell and touch, following protocols recommended by Noble consultants. In the roots, they look for uninhibited root growth, lots of fine roots and white-colored roots.

LEARNING TO GROW

Pastures and Profit

Tim Jones and Chie Morizuka give back to Noble Research Institute after finding success with regenerative ranching.

BY KATIE MAUPIN MILLER

PHOTOS BY KEN SHIMIZU

RETIRED EDUCATORS AND CATTLE PRODUCERS Tim Jones and Chie Morizuka's passions lie at the intersection of learning and land stewardship. While Jones hails from a tiny Texas town, Morizuka was born in one of the world's largest metropolitan areas: Tokyo. Yet both recognize the value of regenerative agriculture.

DEEP ROOTS

When Jones and Morizuka stepped to the helm of Gladney Ranch in Love County, Oklahoma, in 2010, they looked to Noble Research Institute to guide them toward profitability and proper management on their beef cattle operation.

However, the Jones family had already built a decades-long relationship with the research organization — since 1982, when W.A. "Pete" Jones, Tim's father, first reached out for guidance. Pete, a humble oil field worker, had taken on management of the Gladney Ranch at the request of Newcomb Gladney-Seitz, his employer and the ranch founder's daughter. Pete was gifted the ranch following her death five years later.

Most of the farm's pastures have introduced grasses, such as timothy and orchard. However, after more than a decade with no chemical fertilizers and herbicides, many native plant species are returning and will benefit from regenerative practices.

"During the 36 years that my family operated then owned Gladney Ranch, rarely was any decision made without first consulting the experts at Noble Research Institute," Jones says. "There was a reason for that. Noble consultants could always be counted on to give the best research-based, unbiased advice. And, it was always free of charge."

The Gladney Ranch shares even deeper roots with Noble. Decades before Pete Jones cared for the Gladney Ranch cattle, the southern Oklahoma operation relied on the latest industry knowledge from Noble Research Institute. Its founder, J.W. Gladney, reached out to the organization as early as 1949, seeking advice on soil testing, planting, terracing and building organic matter in his soil.

A REGENERATIVE APPROACH

When Jones and Morizuka retired to the ranch, the couple attended most of Noble's educational events and started learning new ways to manage the ranch.

Noble staff helped them select superior cattle genetics. They tailored a breeding program to emphasize calving ease, stayability and docility in their Angus-based cow herd matched with curve-bending, high-growth Charolais bulls. The resulting smoke-colored calves thrived beside their mothers grazing on native grasses.

However, it wasn't more pounds, more calves or more inputs that proved most advantageous to the ranch's bottom line. It was soil health attained through regenerative ranching practices. Following consultation with Noble, the couple was able to reduce their 300-head herd by half in order to adjust to climate variability while increasing profitability. They did it by managing their grazing lands in a way that required no additional inputs.

"The focus changed from raising beef to raising grass with an emphasis on soil health," Morizuka says.

As former monoculture pastures sprung to life with native grasses, fauna and pollinators, the ranch's profitability increased. The couple took long walks each day to check their cattle, and Morizuka remembers realizing her love for caring for livestock and the land as she strolled through the ranch's native grasslands, now rich with clover, bluestem and wildflowers, such as Indian paintbrush.

THE NEXT CHAPTER

In 2018, the family made the difficult decision to sell the ranch, and Jones and Morizuka relocated to Japan to be closer to Morizuka's family. Yet, even more than 6,000 miles from the grazing lands of Thackerville, Oklahoma, the couple sees the value of stewardship and regenerative agriculture. They have recently completed Japan's farmer certification process and are taking steps toward raising beef cattle again. They plan to use many of the same principles and practices they learned in middle America on their Hokkaido island home to focus on regenerative agriculture and sell organic, sustainably raised beef.

Today, the couple still pores over Noble's publications, resources and research to learn about new and better ways to manage grazing livestock to improve the land's health and usability for decades to come. They say they happily support Noble Research Institute, adding that the organization has given them and their family so much.

"As a way of saying 'thank you' to Noble Research Institute for all the support it has given and continues to give, and to help in a small way to fund and support ongoing and future research, we want to donate what we can, when we can," says Jones. He and Morizuka are now regular financial donors to Noble.

For Noble's part, the Institute uses their contributions to develop research, consultation and education programs that help farmers and ranchers find new ways to regenerate their grazing lands and achieve lasting financial stability. Regenerative ranching is the process of restoring degraded soils by using practices based on ecological principles, which means working within the natural environment — comprising soil, plants, water, animals and the humans that manage them — to build organic matter and resilience within the soil.

"Regenerative ranching is a solution for some of the greatest challenges facing both livestock producers and society at large," says Shannon Steele, development officer for annual giving and donor stewardship. "It is satisfying to see people like the Jones-Morizuka family find such success in regenerating their grazing lands and now be in a position where they are excited to give back. It's thanks to people like them that we will be able to come alongside even more farmers and ranchers on their journeys to restore degraded soils and manage the land in ways that are both profitable and good for us all."

Join the Mission to Regenerate Grazing Lands

To contribute to Noble's mission to deliver solutions to great agricultural challenges through donations, securities, tribute/memorial gifts or planned gifts, visit noble.org/about/giving, call 580-224-6247 or email giving@noble.org.

IN MEMORIAM: ANN NOBLE BROWN

March 29, 1930 – April 7, 2021

This spring, Noble Research Institute lost the matriarch of the Noble family. Ann Noble Brown passed away on April 7, 2021. Mrs. Brown was the only daughter and last surviving child of Noble's founder, Lloyd Noble. She played an instrumental role in shepherding the organization from 1951 to 2005. She participated in every landmark decision for more than half a century.

Mrs. Brown was thoughtful, purposeful and kind. She was both a lady of grace and an outdoor enthusiast, willing to trek through the muck on a fishing trip with her husband, David.

Her gentle nature made her an easy friend and an approachable leader. At the same time, she was not passive. When she spoke, she did so with authority. She possessed a clarity of vision for Noble that carried forth her father's legacy.

Noble Research Institute was blessed to have had such a devoted director, who remained committed to Mr. Noble's intentions and purposes for this great organization.

The following is Mrs. Brown's in memoriam. These words are a snapshot of a life that spanned almost a century. They are far from the last words written about Mrs. Brown. Those who loved her and those who knew her will long remember the lasting impression she had on their lives.

In Memory of Ann Noble Brown

Ann Elizabeth Noble was born in Oklahoma City, Oklahoma, at St. Anthony Hospital. The youngest of three children born to Samuel Lloyd Noble and Vivian Bilby Noble, she grew up in Ardmore, Oklahoma. In her early years she also spent summers in California, where the family traveled to escape the Depression-era dust, which aggravated her older brother's asthma.

Her mother died of pneumonia in the pre-antibiotic era, when Ann was only 6. After the tragic loss of her mother, Ann continued to be blessed with the strong and loving maternal presence of her grandmother Hattie Noble, housekeeper Nora Shaffer, and her aunt Mary Tolbert. She and her brothers attended school and lived in La Jolla, California, in a small house overlooking the cove, for the next two years. On returning to

Ann Noble Brown (center) sits among other Noble Board of Directors members, from left: C.C. Forbes, Edgar Holt, Sam Noble, Ann Noble Brown, Ed Noble, Dr. A.A. Kemnitz and James Thompson, on Sept. 12, 1955.

The three children of Lloyd Noble and Vivian Bilby Noble: Sam, Ann and Ed

Ardmore, they moved into the house on D Street that had been purchased shortly before their mother's death. Ann learned early to cook, sew, be a gracious hostess, and of necessity help run a household.

She graduated from Ardmore High School in 1948. She attended Mills College in Oakland for two years, always retaining a fondness for the Bay Area and Tony Bennett's "I Left My Heart in San Francisco." After her father died suddenly, late in her sophomore year, she returned home and attended The University of Oklahoma as a junior. She fell in love with a young Navy lieutenant, Dr. David Brown, older brother of a high school classmate. When David returned from Korea for duty in San Diego, they were married in Ardmore on Nov. 18, 1951. After a honeymoon in Santa Fe, the couple first lived in Corpus Christi, Texas, where David completed his tour at the Naval Hospital. In 1952, they moved to Oklahoma City, which would be home for the rest of their lives.

Ann and David raised three children. The consummate housewife, Ann learned to love traveling with her family in a pickup camper across the American West and into Canada. Later would come travels with friends in more spacious motor homes and cabin life in Lake City, Colorado, for nearly 40 summers. Ladylike Ann also came to delight in donning rain gear, or sunglasses and a hat, to share in David's love of fishing. She enjoyed many trips with dear friends to Lake Ouachita, Lake Fork and Toledo Bend.

She was a longtime trustee of The Samuel Roberts Noble Foundation, established by her father, Lloyd Noble. She was also a trustee on the boards of Oklahoma City University, Heritage Hall, Harn Homestead and the Science Museum Oklahoma (originally named the Omniplex). She was a founding member of the Annie Oakley and Prix de West societies at the National Cowboy & Western Heritage Museum and a 50-year member of Nichols Hills United Methodist Church. She resolutely supported and shared in her husband's work with the Heritage Foundation, Oklahoma Medical Research Foundation and Oklahoma Council of Public Affairs. Ann bequeaths to her family and all who knew her a legacy of kindness, companionable travel, Christian devotion, generosity and quiet charity, memorable home-cooked meals, and love of family and friends.

She was preceded in death by her parents, Lloyd and Vivian; by her brothers, Sam and Ed; by her sister-in-law, Mary Jane Noble; and by her cousins, Margaret Baldridge and Bilby Wallace.

She is survived by her devoted husband of 69 years, David Brown; her three children (and their spouses): Randy Brown (Susan Ross), Susan Brown (Bill McCoy) and Marianne Rooney (Pat); her nine grandchildren: Patrick Rooney (Patterson), Turner Rooney (Gillian), Matthew Rooney (Katie), Clark Ruppert, Ellen Ruppert, Willy Ruppert, Jake Brown (Anna), Katie Brown and David Brown; her nine great-grandchildren: Emily, Caroline and Brooks Brown; Patrick, Lucy and Maggie Rooney; Turner and Luke Rooney; and Teddy Rooney; her cousins Carolyn Smith, Jim Tolbert (Beth) and Sara Orwig; and sisters-in-law Maria Noble and Anne Falin.

Memorials may be made to Noble Research Institute, Nichols Hills United Methodist Church or the National Cowboy & Western Heritage Museum.

Ann Noble (right) and Ed Noble (left) visit with Mike Cawley (center), Noble president from 1992 to 2011.

1945 Recipe: Salisbury Steak

Enjoy a classic beef dinner from the U.S. Navy, based on a recipe used to feed sailors in the year World War II ended and Noble Research Institute began.

INGREDIENTS

For Salisbury Steaks

- 1 ½ pounds ground beef
- ½ teaspoon salt
- ¾ cup bread crumbs
- ½ cup grated onion
- ½ cup beef stock

For Gravy

- 2 tablespoons fat (from cooking the meat)
- 2 tablespoons flour
- 12.5 ounces beef stock
- Salt and pepper, to taste

ORIGINAL RECIPE

This recipe is based on the CHOW blog post, written by Matthew T. Eng, published by the Naval Historical Foundation. Eng shares his experience with cooking "Griddle-Broiled Salisbury Steaks," which was originally published in the 1945 Cookbook of the United States Navy. You can read the blog post and see the original recipe at www.navyhistory.org/2017/02/chow-salisbury-steak/.

DIRECTIONS

Step 1: Combine the ground beef, beef stock, salt, bread crumbs and grated onion in a large bowl, and mix to combine.

Step 2: Form patties from the meat mixture. You should be able to get about six to seven patties.

Step 3: Heat a nonstick skillet to medium-high heat, and cook patties. Flip the meat about halfway through cooking to ensure even cooking.

Step 4: Once the meat has reached an internal temperature of 160 degrees F, set it aside. Keep about 2 tablespoons of fat in the pan to make gravy.

Step 5: Add the beef stock to the meat drippings, salt and pepper as desired, then add the flour and whisk vigorously to combine so that there are no clumps.

Step 6: Bring the gravy to a boil, continuing to stir until thickened.

Step 7: Lower the heat on the gravy and simmer before serving.

Step 8: Ladle the gravy over the cooked meat patty.

Step 9: Enjoy!

NOBLE AND A NAVY FAVORITE

Salisbury steak, or hamburger steak as it was called before World War I, was a staple in Navy cookbooks by 1904. We think it's likely that founder Lloyd Noble might have enjoyed a Salisbury steak or two during his brief service in the Navy, after enlisting in spring 1918. The steak is named after Dr. J.H. Salisbury, who promoted a meat-based diet as the means to optimal health in the mid-1800s. His original recipe called for "the muscle pulp of lean beef (to be) made into cakes and broiled," and it was served with Worcester sauce, mustard, horseradish or lemon juice.

THE STRENGTH TO CHANGE

by J. Adam Calaway, editor

There is gym strong and then there is farm strong.

Gym strong looks good. Weights, trainers, protein drinks and persistence sculpt a magazine-ready physique. There's nothing wrong with gym strong.

Farm strong is different, though. Farm strong is functional. The body is not sculpted but hardened. Driving fence posts, throwing hay bales and arm wrestling with Mother Nature causes the body to set like concrete.

My grandfather was farm strong. Like worn bootstrap or sheet metal, you just couldn't break him. He was a Kansas boy, a short fellow whose square frame resembled a block of unchiseled granite.

He was born on a farm. He worked on a farm almost every day of his 90 years. He pulled life from the earth until we returned him to it. He was so stubborn he died twice. The first time didn't take. He lived another two decades; and when he passed three years ago, there was still 60 head of cattle in his one remaining pasture.

My formative years are filled with faded images of my papa and summers working the farm. One of my earliest memories is of a cattle auction where I ate a hamburger with a tomato because I was too afraid to tell him I didn't like tomatoes.

I remember how he could build anything he saw or imagined. Engineer. Architect. Agriculturist. Veterinarian. Horticulturalist. Biologist. You have to wear all the hats; that's part of being farm strong. And, I remember his hands. Scarred and calloused, they were always bleeding and he never seemed to notice.

When I was about 5 years old, we took his favorite "horse" (a blue Yamaha four-wheeler) out to check cattle. He would set me in front of him like a baby kangaroo attached to the front of his bib overalls. We'd cruise the fields, looking at the herd. He'd grunt and sniff and take mental notes. There weren't a lot of words because there wasn't a lot to say.

One particular field was uneven and terraced in areas. Through my child's eyes, I remember seeing the embankment ahead — probably 8 feet high. I felt the pull of the four-wheeler as my grandfather mashed the accelerator to ramp us up the side. Instead of our momentum carrying us onto the plateau like we had done before, the four-wheeler went straight up. We hung in the air for a heartbeat then gravity reclaimed us.

The back tires clipped the lip of the embankment. We fell to the ground with a thud; him hitting first and me landing on his chest. The handlebars headed straight for my face until I saw my grandfather's arms and legs stick straight out. He snatched the falling four-wheeler out of the air and flung it to the side, saving us both. Yes, he was that strong; sometimes too strong.

His lessons were often wrapped in barbed wire. Life was hard on the farm, and he wanted me to be farm strong too. Our paths diverged in my teenage years, and we never fully reconnected. His world was black and white, and mine was Technicolor. There was a growing divide, and we didn't know how to bridge it. He didn't have the words, and I wasn't sticking around to see if he found them.

Later in life, my mother told me that he was proud that I worked for Noble — an organization dedicated to supporting farmers and ranchers. That made sense to him.

As an adult, I've come to learn several truths about being farm strong and about my papa. I may not have walked a mile in his boots, but I've walked beside those who have. Now I know he stood in places where others couldn't or wouldn't.

Farming and ranching is more than just the pretty pictures we marketers put in a calendar — the golden sunsets and newborn calves. It's a lonely affair between an old man and the land. It's the raw humanness of a kid watching his grandfather stand in a drought-stricken field, praying to God for a few inches of rain so that he can make it one more year. Man, if I only knew then what I know now.

Noble announced it was focusing all operations on regenerative ranching in February, but we've been working on this organizational move for almost two years. We've been studying and absorbing as much information as we can.

Soil health principles are the foundation of regenerative ranching. These principles can rebuild soil organic matter, making the land healthier and more productive. Healthy soil creates more resiliency in drought and flood, results in less chemical input use and subsequent pollution, provides cleaner air and water, enhances wildlife habitat, and captures carbon in the soil to combat climate variability. In short, my papa could have had a successful operation and taken care of the land for future generations. It's everything he prayed he could do.

I've thought a lot about him these last two years. I wonder what he would have thought or how he would have reacted to regenerative ranching. He farmed the same way for nearly nine decades. He broke all the rules of soil health — not out of malicious intent but because that's what was taught and that's what he practiced.

I wonder if he would have been able to change. Would the peer pressure and tradition have kept him from changing? It's one of the primary barriers that prevents producers from implementing regenerative ranching.

Could he have blazed a new trail when it went against everything he knew, everything he had been taught? Could he have pivoted to new practices when others would have questioned him? Did he have the strength to change?

I will never know the answer. However, I'm part of a team dedicated to helping farmers and ranchers overcome those barriers and answer those questions for themselves. It's a challenge that will require a Herculean effort but one that we will gladly tackle.

Because that's part of being farm strong.

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PLEASE DELIVER TO:

Starting down the regenerative ranching path is not without its challenges. Turn to page 30 to find out how three ranch families are breaking barriers and overcoming their challenges to improve their bottom line and the land.