

JOIN US IN
**SEEKING SOLUTIONS
TO AGRICULTURE'S
GREATEST CHALLENGES**

Farmers and ranchers face complex challenges that affect the land and their livelihoods. At Noble, we provide research-based solutions to help them make confident decisions for today and tomorrow.



THE PROMISE

There is an unspoken promise between generations, a pledge to leave behind a world better than the one you received.

Essential to this aspiration is stewardship of the land — the intricate web of soil, microbes, plants, animals and humans that serves as the wellspring of life.

Today's land, specifically grazing land, suffers from overuse and under-management. Pollution; urban sprawl; the ever-increasing demand for food, fiber and feed; and the global depletion of soil health all threaten the vitality of tomorrow.

Humanity's general disregard for environmental stewardship and its abuse of natural resources has resulted in a lack of clean water, food shortages and economic distress around the world. Without these bedrock elements, society is at risk. Underpinning this lack of stewardship is an industrialized agricultural system that relies heavily on inputs, tilling the ground, and growing cheap food. The impact on both human and environmental health is profound.

Farmers and ranchers face economic uncertainty from volatility in the natural environment (i.e., drought, flood, pests and disease) and markets (i.e., supply, demand and politics), which frequently leads to choices that negatively impact the environment or the farmer or rancher's slim margins. They often work within a system stacked against them — either they adopt an industrialized system or go out of business.

However, these guardians of the land hold the ability to help mitigate environmental damage caused by past practices. There is a way to grow food that can nourish both ourselves and the environment, and it begins with regenerative agriculture.

By focusing on fundamental stewardship principles, farmers and ranchers can protect the topsoil, ignite soil health and boost resilience of the land, for the benefit of all of society.

Our fidelity to the future then begins at the farm gate.



WHAT IS REGENERATIVE AGRICULTURE?

Conventional agricultural systems strip the ground of nutrients and require chemical inputs, but there is a way to ranch that can nourish the ground while improving resiliency for the land and profitability for farmers — regenerative agriculture.

Regenerative agriculture is the process of restoring degraded soils using practices based on ecological principles. Regenerative agriculture promotes:

- Building soil organic matter and biodiversity.

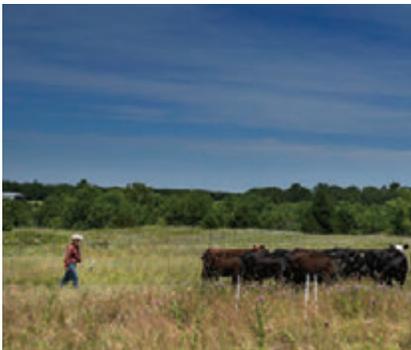
- Healthier and more productive soil that is drought- and flood-resilient.
- Decreased use of chemical inputs and subsequent pollution.
- Cleaner air and water.
- Enhanced wildlife habitat.
- Capturing carbon in the soil to combat climate change.

Our goal is to assist producers in becoming soil regenerators. We are working with ranchers to implement practices, and they are seeing tangible

results. Regenerating the land is achievable, but it is not a recipe. It starts with an understanding that the soil, plants, animals and humans are all connected, meaning every decision must work with this natural system and not in spite of it. This is a complex process. Regenerative agriculture requires a long view and dedication to practices such as integrating livestock into land management, using cover crops, including crop diversity, and implementing low-till or no-till practices.

A THREEFOLD NEED

Land stewardship is not a linear undertaking. It is a network of interconnected decisions that hinge on three primary drivers:



PROPER MANAGEMENT

Agricultural land is a living ecosystem that must be managed. Properly managed land leads to increased soil organic matter, which minimizes soil erosion, holds water to sustain through periods of drought, enables productive plant growth, requires less fertilizer and inputs, impacts water quality, and sequesters atmospheric carbon. Proper management also boosts soil health, which makes farms less susceptible to pests and disease. Concurrently managing animals, soils, plants and water can be complex. Providing guidance and understanding is the first step.



POSITIVE ECONOMICS

Agriculture is a notoriously low-margin, high-risk profession. If ranchers cannot earn enough to maintain their operations, they can lose their livelihood, their legacy and their children's inheritance. In recent years, there has been a substantial increase in farm bankruptcies. Producers who can barely sustain their operations often sacrifice long-term land stewardship practices for short-term returns. Stewardship and positive economics are not mutually exclusive; land can be regenerated, animals properly managed and positive economics achieved to enable a favorable cycle to continue.



RESEARCH-BASED EDUCATION

Since the 1960s, agricultural land management has depended on the introduction of chemicals and man-made fertilizers for success. In the minds of many, more inputs equal more yield. This mentality has stripped the soil of much of its nutrients, resiliency and efficiency. The next generation of farmers and ranchers will not be able to rely on this input system. Instead, they will need to produce more food with fewer resources and inputs. In addition, future decision-makers will grapple with all of their predecessors' natural and economic trials while sorting through a wash of untested technologies. They will need reliable resources for education and counsel. These resources must be built on a bedrock of research that enables them to make informed, intentional decisions.

MISSION AND VISION OF ORGANIZATION



Noble Research Institute has been providing solutions to great agricultural challenges since 1945. To generate substantial impact toward land stewardship, Noble targets pasture and rangeland (also called grazing lands). At 655 million acres, pasture and rangeland make up the single largest usage of land in the United States.

About 85% of the nation's grazing lands are unsuitable for producing human food crops, such as corn. Still, these "silent" acres contribute to meeting the globe's growing demand for food.

Historically, rangelands naturally evolved with grazing by large animals, including bison and elk. Today, domesticated grazing animals convert grasses, legumes and forbs to nutrient-dense food for human consumption.

Cattle, in particular, are an integral part of properly managing pasture and rangeland ecosystems; importantly, cattle spend the majority of their lives on grazing lands. They play a key role in nutrient recycling through manure distribution, stimulating plant growth and working the soil. In addition, cattle's presence on the land and the consequential biological plant-soil-microbe interactions of their grazing operate in concert to store atmospheric carbon in the soil.

Noble believes in stewardship through management and that proper management can help heal the land by focusing on regenerative agriculture, a production method that means every decision must work with the environment's natural rhythm and not in spite of it. Noble's experts work to provide grazing-animal producers the knowledge and skills to rehabilitate their ranches and farms — through application of proper management decisions. The focus begins with improving soil health, then extends to making informed choices regarding animals, water, plants and economics. There is no one-size-fits-all approach for such management, as each plan must be tailored to fit the specific needs and goals of each operation. These variables drive Noble's fundamental and applied researchers to provide practical answers and new products to support producers along this journey.

Our quest is to guide farmers, ranchers and all land managers to contribute to a global food supply, positively impact the environment and leave the land better than they found it.

This is why we exist. This is what we have successfully done for more than seven decades. And this is what we continue to do today.

HISTORY OF ORGANIZATION

Noble Research Institute was born from the idea that the land is one of society's fundamental resources. Philanthropist Lloyd Noble witnessed firsthand the dramatic impact of the 1930s Dust Bowl. He saw how a lack of proper land stewardship — spurred by a deficiency of knowledge — left the soil uncovered and susceptible to drought. When little rain fell for almost a decade, the resulting disaster crippled the land and the people who depended on it.

The life-giving soil turned to dust and blew away. Fields lay in ruin, unable to produce a crop. The region's economic engine stalled, and families scattered in every direction like the soil in the wind.

Noble knew a healthy economy and productive society depended on a foundation of agriculture. Noble became a leading voice for land stewardship and soil conservation. In 1945, he established Noble Research Institute (formerly The Samuel Roberts Noble Foundation) in hopes of safeguarding the soil and keeping the land healthy for generations to come.



Noble Research Institute is focused on land stewardship with producer profitability as it relates to our nation's grazing lands because:

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

Most soil health initiatives are directed to row-crop acreages, which fails to address

**HUNDREDS OF
MILLIONS OF ACRES
OF DEGRADING
GRAZING LANDS.**

Managed grazing animals — including cattle, horses, bison, sheep, goats and others — benefit the health of these lands.

**MORE ACRES
ARE IN
PASTURE AND
RANGELAND**

than are used for row crops, cities and timberland.

The U.S. is the
world's largest
beef producer,
with more than 30 million
beef cattle spread across all
50 states.



LIVES AND ACRES CHANGED

Noble has been making a difference in ranchers' lives for generations. We are working with today's agricultural producers to help them make sound business and management decisions. We positively influence more than 1 million pasture and rangeland acres and the families who manage them. Our research, programs and personalized approach have had a tangible impact on ranches across the Great Plains. We have helped thousands of producers improve their operations and make strides toward long-term profitability so that they can reinvest in land stewardship.



Every decision you make is tied to another decision on the ranch, and you find out if you made the right one years down the road. Noble has helped us navigate the responsibility we have to make good decisions today so we can take care of the land and raise healthy animals long-term.”

—MEREDITH ELLIS,
G Bar C Ranch, Texas



We knew we needed help, and thankfully Noble was able to come to our rescue. We knew the basics, but so much had changed in 30 years. Without Noble, we probably would have floundered.”

—JOE DOBSON,
Dobson Ranch, Oklahoma



There's always a more productive, more profitable, more beneficial way to manage our natural resources. Noble Research Institute has been like a friend that we can run questions or ideas by as we're trying to make the most positive impacts out here.”

—YATES ADCOCK,
Middle Creek Ranch, Oklahoma

A NOBLE PROCESS

Noble Research Institute has set a bold goal: implement proper land stewardship on millions of acres in the next decade. Achieving this goal will engage influential producers, set the stage for a national movement and generate significant positive environmental impact for society.

Noble is uniquely positioned to accomplish this goal. We integrate science and research within working ranches. We focus on producers' needs and challenges. With approximately 350 employees from more than 20 countries, we have brought together the world's best minds around a shared vision for bettering the world through regenerative agriculture.

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We have a history of developing multifaceted systems for implementing regenerative management practices within the pasture and rangeland setting. Our work hinges on three primary endeavors:



BUILDING RELATIONSHIPS

We start with the farmer and rancher. Noble has built generational relationships with producers and changed their lives through consultation and interaction. We understand their trials. We encourage. We build trust because we care. And we guide them through change, helping them achieve their production goals while applying strategies to enhance land regeneration.

PRACTICAL RESEARCH

The questions ranchers ask and the challenges they face serve as the starting point for our research, which spans from the laboratory to the field. We develop and breed new forage plant varieties for animal/soil nutrition and changing climates. We prove the causal pathways between management practices and land regeneration. Through our own research ranches and farms, we look for answers to real-world problems and test new technologies to understand the practicality of their implementation. Our research is purposeful and designed to transform the status quo.

EDUCATION FOR ALL

We offer a competency-based educational program that conveys practical skills to producers of all ages and experience levels. Noble seeks to provide the best information that enables farmers and ranchers to make informed decisions for their operations, mitigate risk, and give them the best opportunity to succeed. With the national decline of cooperative extension and federal technical programs, a need exists to reach the farmers and ranchers of this nation. Noble has the opportunity to design and coordinate the delivery of competency-based training and education to producers nationwide.



The obligation that rests squarely on the shoulders of each generation is not what they inherit, what they have handed to them, or what they acquire from the standpoint of wealth or position, but what they do with the wealth or power that they have in their hands.”

—LLOYD NOBLE, 1943

SHAPING THE FUTURE OF AGRICULTURE

Noble’s work is forward-looking. Our researchers seek new innovations to help mitigate risk, conserve natural resources, improve grazing animal production, and regenerate the land. We work to deliver solutions to great agricultural challenges with projects that look at:

- Developing new forage varieties that increase uptake of nutrients from the soil and optimize their use within the plant.
- Breeding and releasing new, better-quality grazing plants that can be grown across the nation.
- Building soil organic matter via grazing animal management, use of cover crops and the development of more robust plant roots.
- Designing and delivering holistic management practices that further the productive interaction of a ranch’s soil, plants, water, animals and economics.
- Using technology to measure soil carbon content and other soil health measures.



BY THE NUMBERS

Noble seeks to bring millions of grazing land acres under regenerative practices in the next decade. Land improvement will be verified with tangible metrics. We are developing a land stewardship validation system to quantify our impact. Land regeneration (whether in the row crops of the Midwest or the nation's pastures and rangelands) begins with building soil health, and aspects of soil health such as organic matter content serve as metrics within our validation system.

Soil health affects myriad ecological systems: plant productivity and reproduction, erosion, water absorption and resiliency, wildlife habitats, vegetation change, pest and disease resistance, and a remarkable amount of carbon sequestration.

For generations, soil has been seen as a medium to be manipulated through chemical inputs instead of being viewed as a living ecosystem. The key to building soil health is to increase organic matter, which is the catalyst for below-ground activity of microorganisms.

Today, tests exist to measure soil organic matter. In some existing programs (focused on cultivated row-crop acres), farmers have seen soil organic matter increases of 0.33% to 0.5% over three to five years. While these are seemingly modest gains, "poor" soils in a pasture and rangelands setting exhibit less than 1% soil organic matter, and "good" soils exhibit 2% to 6% soil organic matter. Making a 0.5% gain in pasture and rangeland would have a transformative effect.

We know the benefits to ranching are possible, because early adopters are currently demonstrating improvement to their soils. Their results are remarkable. Modest gains in soil organic matter have produced more productive soil and have reduced the need for costly farm inputs, such as fertilizers. This, in turn, reduces nutrient runoff, translates into improvements in water quantity and quality, and increases carbon sequestration.

Researchers say that more carbon resides in soil (2,500 billion tons) than in the atmosphere (800 billion tons) and all plant/animal life (560 billion tons) combined.

Increasing soil organic matter in pasture and rangelands will help to reduce atmospheric carbon dioxide. By creating carbon sinks — natural reservoirs that can hold carbon — we can reduce the greenhouse gas effect and slow the warming of the atmosphere.

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

Increased water-holding capacity reduces the need to use water for irrigation. It also improves the land's ability to withstand drought.



THE NEED TO GO FURTHER

The United States is the world leader in beef production, and we can and should lead the world in regenerating the soil of pastures and rangelands for the benefit of all.

Conventional agricultural practices deplete the soil of its nutrients and resilience. In contrast, some early research has shown that regenerative agriculture methods allow ranchers to accommodate more cattle per acre, lower calf and cow mortality, use less feed, and reduce herbicide use. Regeneratively managed ranches achieve multiple goals simultaneously: more diverse and productive soil, healthier environment, and more stable economics.

Noble's researchers, consultants and staff have operated in this sector for decades. We work every day — in the laboratory and on the land — on the challenges that impact pastures and rangelands. We support today's beef producer as well as the productivity of other grazing animals. We improve the land. We innovate and provide solutions to positively impact the land, the animals, the producers, our food and our society. But we must go further.

JOIN US IN REGENERATING OUR NATION'S GRAZING LANDS.

Farmers and ranchers must navigate economic uncertainty, natural calamity, pest and pestilence as they attempt to safeguard the land for the whole of society. Your gift will help us deliver solutions to great agricultural challenges like these. The most pressing of these needs include:



1 Support our researchers as they seek innovations both in the laboratory and on the ranch. Your gift will advance greater scientific understanding of the environments in which cattle graze and link management practices to soil health impact.



2 Further our work to develop a validation system that quantifies land stewardship. This will allow producers to measure their land's ability to help mitigate climate change through carbon sequestration and to improve ecosystem functions, from water quality to wildlife habitat.



3 Help us provide educational programs for all ages. You'll be enabling farmers and ranchers to make informed decisions for their operations as well as supporting the next generation's understanding of science and agriculture.

TO DONATE OR FOR MORE INFORMATION

www.noble.org/giving **P.** 580-224-6247 **E.** giving@noble.org

A CALLING FOR US ALL

There is indeed an unspoken promise between generations, a pledge of stewardship to leave behind a world better than the one we were given. We believe this goal is within our reach.

Noble brings more than seven decades of service to agriculture through research, education and on-the-ground relationships. Our time-tested methods have helped revitalize land and the lives who depend on it. We have seen virtually barren land flourish again. We have seen producers on the brink of devastation become master stewards of their land.

We know that it takes time, personal grit and a team of like-minded individuals to bring regenerative agriculture to reality. We ask that you join us in our ongoing pursuit to transform the land so that it may produce more and healthier food, withstand climate challenges, and prosper for generations to come.





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