

A REGENERATIVE RANCHING PUBLICATION FROM NOBLE RESEARCH INSTITUTE

LEGACY

FALL 2022 | VOL. 16, ISSUE 1

MORALES
FEED & SUPPLY

THE

Whys, Wills & What Ifs

OF REGENERATIVE RANCHING

THE RANCH LIFE IS FULL OF UNKNOWNNS, but is there a path to finding the answers? Three ranchers share their journeys with the questions. And one research project seeks the answers.

Make a difference while you shop.

Support Noble Research Institute when you make eligible purchases at



Visit smile.amazon.com

AmazonSmile is the same Amazon you know. Same products, same prices, same service.

Select your charity

Search for **Noble Research Institute** and confirm as your charitable organization.

Make a purchase

Amazon will donate **0.5%** of the price of your eligible purchases at no cost to you.

amazonsmile
You shop. Amazon gives.

▶ Chuck Trowbridge uses temporary fencing to divide pasture into half-acre paddocks. His grass-finished steers gladly move three times a day for fresh forage.

features

FALL 2022 | VOL. 16, ISSUE 1

20

STACKED FOR SUCCESS

A DIVERSE MIX OF LIVESTOCK adds economic value and soil health on a built-from-scratch Texas ranch.

COVER STORY

26

THE WHYS, WILLS & WHAT IFs OF REGENERATIVE RANCHING

In the “hold my beer” of all grazing studies, Noble and its research partners will do intensive metrics and analysis of grazing management across the U.S. for the next five years.

40

THE GENEROUS GIFT OF GOOD SOIL

Get to know three organizations whose financial contributions will have a lasting impact on soil health and rancher well-being.

4

FROM OUR RANCHES

There's an art to regenerative grazing, especially across a wide range of ranch conditions. See how Noble ranch managers design and carry out our grazing plans.

12

REGENERATIVELY SPEAKING

Our guide to timely online resources about regenerative ranching — explore innovative articles, videos, podcasts and social media accounts to follow.

48

DO-IT-YOURSELF

Turn leftover steak into a great BBQ steak and onion pizza, and build a movable feeding station for the faithful dogs who guard your sheep and goat herds.



52

BEFORE YOU GO

Ode to The Farm: "As the rancher tends to the land, the land heals the soul of rancher."



ON THE COVER

More than "the chicken man," Oklahoma entrepreneur Brett Peshek does everything he can think of to enrich his soil while juggling multiple enterprises. He's one of three ranchers profiled in THE WHYS, WILLS & WHAT IF'S OF REGENERATIVE RANCHING.



4



12



48

LEGACY

FALL 2022 | VOL. 16, ISSUE 1

STEVE RHINES
PRESIDENT/CEO

J. ADAM CALAWAY
EDITOR/WRITER

RACHAEL DAVIS
GRAPHIC DESIGNER

ROB MATTSON
PHOTOGRAPHER

TARA LYNN THOMPSON
WRITER

KATRINA HUFFSTUTLER
WRITER

MARILYN CUMMINS
COPY EDITOR

TIM WOODRUFF
WEB DESIGNER

CONTRIBUTING WRITERS
Marilyn Cummins
Courtney Leeper Girgis

Legacy is published by the Department of Communications at Noble Research Institute. Noble Research Institute, LLC (www.noble.org) is an independent nonprofit agricultural research organization headquartered in Ardmore, Oklahoma. Noble's goal is to achieve regenerative land stewardship in grazing animal production with lasting producer profitability. Achievement of this goal will be measured by farmers and ranchers profitably regenerating hundreds of millions of acres of U.S. grazing lands. Noble aims to remove, mitigate or help producers avoid the barriers that deter the lasting use of regenerative, profitable land management practices in grazing animal production.

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.

Legacy is provided at no cost to the general public as a courtesy of Noble Research Institute. To receive a copy of the magazine or to change your mailing address, please email jacalaway@noble.org.

Noble Research Institute, LLC
2510 Sam Noble Parkway
Ardmore, Oklahoma 73401
580-223-5810 (general information)
580-224-6209 (media)

ISSN: 1939-5035



Copyright ©2022. All rights reserved.

RESEARCH IS OUR MIDDLE NAME

CONNECTING GRAZING AND SOIL HEALTH

The Foundation for Food and Agriculture Research awarded Noble Research Institute a \$9.5 million grant to lead critical research that is focused on understanding how a farmer or rancher's grazing management decisions impact soil health and producer well-being. Noble Research Institute is providing \$7.5 million to the Metrics, Management, and Monitoring project, with additional financial contributions from Greenacres Foundation, The Jones Family Foundation and ButcherBox.

Read more about the project, the questions being posed by ranchers, and how Noble and its collaborators are seeking to answer them in our cover story, "The Whys, Wills and What Ifs of Regenerative Ranching," on p. 26.

The countryside of south-east Wyoming looks like the surface of the moon. Arid plains stretch uninterrupted to the plateaus that ridge the horizon. There are no trees, fence lines or anything much taller than a boot to obscure the view. The entirety of the visible surface is dotted with sagebrush and herbaceous flowering plants that, when repeated for endless miles, mirror the pockmarked lunar surface. This is where the Great Plains truly earns its moniker.

In late August, more than a dozen researchers and staff — from Noble Research Institute, the University of Wyoming, Colorado State University, Michigan State University, Texas A&M University, USDA/ARS-Beltsville and Quanterra Systems — gathered to take hundreds of soil cores, measure water infiltration and build flux towers.

This is the third such stop on this interorganizational band's tour. They held two similar sampling weeks earlier in the year: one at Noble's ranches in Oklahoma and one in Michigan. The three sessions serve as the initial leg of the Metrics, Management, and Monitoring (3M) project.

The \$19 million research initiative aims to understand how a farmer or rancher's grazing management decisions impact soil health and, in turn, how soil health can positively impact land and producer well-being. 3M is one of the most robust investigations of our grazing lands across time and space, diversity of landscapes and management approaches.

So why does any of this matter to you?

At Noble, research is our middle name because we

understand that ranchers like you are actively managing your business through a series of interconnected challenges (increasing costs, supply chain blockages, regulation, generational transfer, climate variability and debt) that spur a complex series of questions.

You are asking questions, and we are doing more than listening. We're mobilizing our research to answer the hard questions: How do I improve soil health and build a stronger bottom line? How do I leave this land to my children? How

do I navigate the challenges of modern agriculture? Is there a different way beyond what I've always done? How do I begin such a transition?

We conduct ranch-scale research to generate a deep well of knowledge. Then we synthesize that information into usable educational products. We deliver these products to you so that you can make informed decisions and build a multi-generational business. In short, research at Noble has the specific end goal of education.

What starts as soil samples, water measurements and production data on research sites across the country evolves into applicable knowledge that helps inform your ranch operation in your geography. Transformation takes information, and information requires investigation.

Rest assured, this is not research to merely satisfy the curious minds of scientists. This is an army of like-minded soldiers marching for your cause. We are producers first and foremost, devoted to developing and sharing outcomes to benefit an entire industry. We will sort through the spaghetti noodles of interwoven issues and find answers that propel our collective journey deeper into the application of the soil health principles.

Why soil health? Because healthy soil makes the land

more resilient. Working with nature reduces the need for input costs and galvanizes your bottom line. Healthy soil creates a thriving ecosystem, productive land and a legacy that ultimately spreads from your ranch to the surrounding communities, benefiting us all.

You're going

to great lengths to steward your land, ask important questions and learn. We're committed to finding usable answers, being a faithful friend and a helpful guide.

Heck, we've already been to the moon.

Blessings on your journey,

J. Adam Calaway

THIS IS NOT RESEARCH TO MERELY SATISFY THE CURIOUS MINDS OF SCIENTISTS. THIS IS AN ARMY OF LIKE-MINDED SOLDIERS MARCHING FOR YOUR CAUSE.

from our ranches



NOBLE RANCHES | OSWALT RANCH AND RED RIVER RANCH

THE ART OF REGENERATIVE GRAZING

BY MARILYN CUMMINS

GENERAL RANCH MANAGER JOE POKAY and the Noble Ranches team start the year with a grazing management plan for each of Noble's seven ranches. Working those plans is very much an art, adapted for the idiosyncrasies of each ranch and what the managers observe each day.

General ranch manager Joe Pokay moves cows, calves and bulls to a fresh grazing area in the north pasture on Noble's Coffey Ranch.

The Noble Ranches team oversees nearly

14,000 acres

Joe Pokay hasn't found a "one-size-fits-all" plan for regenerative grazing. He's discovered the opposite. The seven Noble Ranches he oversees — nearly 14,000 acres in all — are anything but uniform in terrain, grass species, soils or infrastructure. Each needs a grazing management plan tailored to the territory.

Noble's largest property, the Oswalt Ranch, is near Marietta, Oklahoma. It's almost all native range with warm- and cool-season prairie grasses; rough, rocky topography with creeks and gulleys; with 50% of the total acres grazeable for the cow-calf and stocker operations. It's now also home to Spanish goats that help with brush encroachment.

Then there's the Red River Ranch. Bordered by the Red River on the south, it's mostly level, sandy terrain — vulnerable to both flooding and wind erosion — with a lot of introduced grasses, mainly bermudagrass. The majority is grazeable, including the 450-acre pecan orchard, one of the oldest improved orchards in the state. Noble runs a cow-calf operation at Red River, adding stockers seasonally, and has introduced sheep as an enterprise this year.

"They're completely different ranches," Pokay says. "The goals are the same — we want to improve soil health and make sure our animals are performing at the level we want. We

adhere to the same principles, but we go about them in completely different ways."

By principles, he's referring to the six soil health principles: know your context; cover the soil; minimize soil disturbance; increase diversity; maintain continuous living plants/roots; integrate livestock.

"The beautiful thing about the principles is it (the terrain) doesn't really matter," Pokay says. "They've worked in just about any environment you can imagine, from the Chihuahuan Desert to Alberta. The principles are few, and that makes them easy to adhere to." Just be sure to follow the principles, he says, and good things should follow.

That being said, following the principles on each of the seven

ranches with a 15-person ranch team takes planning and coordination. That's where the grazing management plans come in, and the art of matching plan to property.

THE GRAZING MANAGEMENT PLAN

"The overall goal for the grazing plan simply is to manage our grazing to allow for adequate recovery of plants," Pokay says. "So, we want to eliminate overgrazing, and overgrazing is a function of time, not necessarily stocking rate or stock density.

"Our whole goal is to be able to have our animals perform and, through our management of grazing, to improve the land and improve the soil," he says. "Done successfully, this in turn improves grazeable acres, improves the quality of forage and improves animal health, as well."

Another way of looking at the grazing plan's purpose is to have it "mimic the herds of bison that used to roam the prairie," Pokay says. They grazed an area and moved on, letting the native prairie

Cows and calves graze a river-bottom pasture on Noble's Red River Ranch.



7 THINGS TO INCLUDE IN A GRAZING PLAN

1. Goals
2. Maps
3. Existing infrastructure
4. Existing forage types and production
5. Grazeable acres
6. Potential stocking rates
7. Any additional equipment or infrastructure needs

A visitor from the King Ranch Institute for Ranch Management examines grazing plans and records during a regenerative ranching workshop on Noble's Coffey Ranch.



grasses recover for long periods before they were grazed again.

On today's ranches, it takes careful planning to emulate what the bison did naturally. "Our main goal is not to come back to an area before the plants are recovered from the previous grazing event," he says. "When the grass is growing quickly, we don't need as much rest. And when it's growing slowly, we need longer rest. If the grazing event is in August, the plants might not be fully recovered until June the next year."

By recovery, Pokay means watching for the plants to begin their reproductive stage, which is a good sign that the roots have recovered and built up reserves. They keep records of the grazing and recovery periods for each pasture to help predict how long they can graze the next year, if conditions are similar.

Recovery periods vary seasonally, as well as by location, as the forages grow at different speeds. "There are some places, like at the river, where the introduced grasses recover a lot faster. So (ranch manager) Kevin Pierce's recovery period at Red River is usually a lot shorter

than our recovery period on the native range at Oswalt."

Pokay says they plot out grazing for the entire year, planning for recovery periods and areas where they will stockpile forage for the dormant season.

"We also want to plan to not graze the same areas at the same time of year all the time." While each ranch's grazing plan covers a year at a time, "we also iterate it a lot, depending on how things are growing and if we're sticking to our plan, or if we're moving faster or slower than the plan called for."

There are other practical aspects to the plan, based on the layout of the ranch, he says.

"We really try to focus on having our grazing plan match up to when we're

going to be near a set of pens. So, if we need to wean or ship or pregnancy check or something, we filter our plan through those needs." Pokay also says they are using more portable tanks with quick-connect couplers along the water pipelines so they can adapt to multiple grazing locations rather than work around permanent water sites.

"THE BIG THING IS JUST BEING OUT THERE. IT'S REALLY IMPORTANT TO SPEND SOME TIME WITH YOUR LIVESTOCK, BECAUSE THEIR BEHAVIOR WILL TELL YOU MORE THAN ANYTHING."

—JOE POKAY

"The problem with permanent anything is when cattle use an area all the time, they hurt the ground and kind of wallow everything out," he says. However, there are times they may want the herd effect of hooves to break up capping on bare soil and jumpstart its recovery, or to stamp down brushy areas to add both ground cover and organic matter to the soil.

WORKING THE PLAN

Once the grazing plans are set, the managers use the grazing charts to guide the graze timing and pasture moves.

"It's understood that if we have a big pasture and the grazing plan says we're going to stay in there for five days, that means we're going to move 'em five times. That's just inherent in our grazing management, as we try to move animals at least once a day," Pokay says. And yet, it's not as simple as that. For example, deciding on the size of a paddock for a particular day.

"It really depends on what our goal is for that graze, and if we're trying to have high animal impact or if we're trying to add more performance," he says. "The size of our grazing is more dependent on what the animal needs, so we'll go out and figure out how much grass there is in that paddock, and then we figure out how much the animal needs for that day.

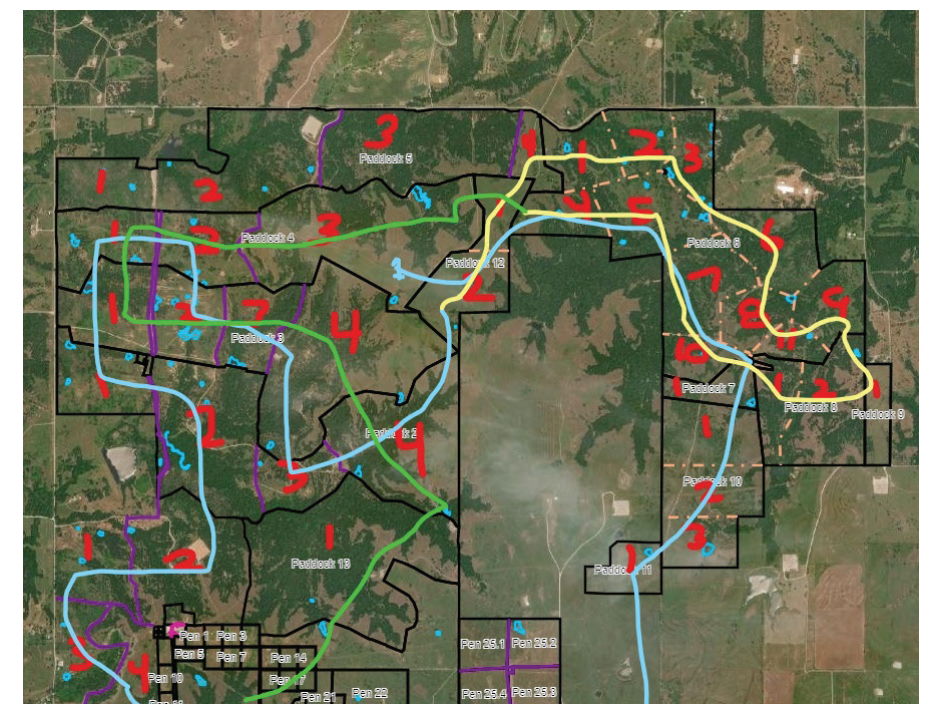
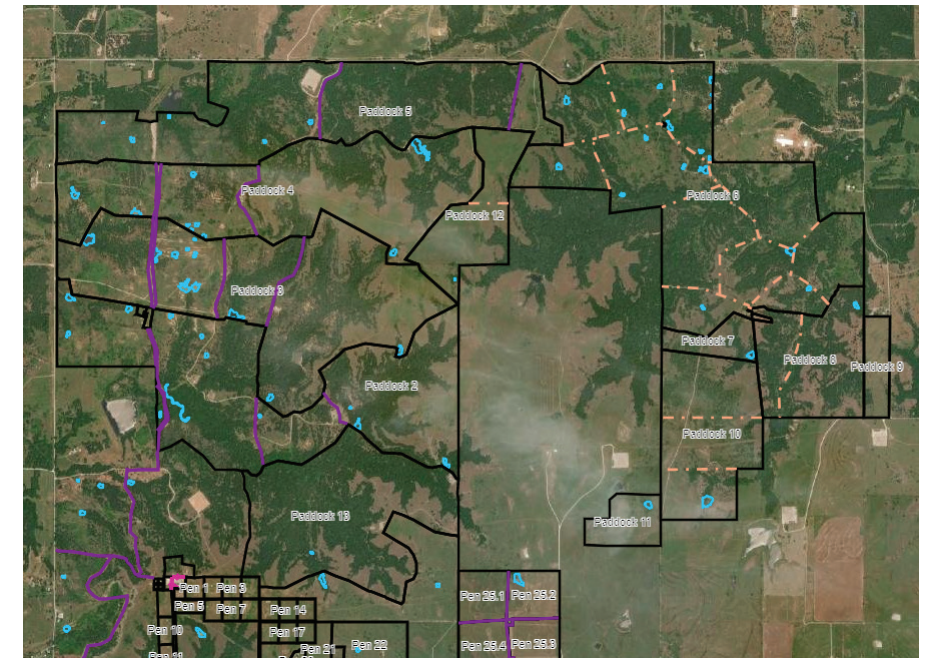
"We always plan to leave some residual behind and keep the soil covered, so we don't want to take every possible thing out of it. Yet we want to give 'em as much as they need every day. Sometimes it's two or three days between moves, and sometimes we move them more than once a day."

THE ART OF GRAZING

Pokay likes to call what they do the art of grazing because you have to take in and consider everything. It doesn't work to just say "this is how you do it" and blindly follow a strict plan. There's no "one thing" to watch and then do "X." It matters if it's intensely hot or windy or humid. And it matters what the animals are telling you.

Noble ranch team members check their animals every day, making sure they have two or three days' worth of grass on weekends. They also make it a point to visit each other's ranches, observing and talking through approaches as they hone their eyes and their art.

"The big thing is just being out there," Pokay says. "You can't just drive by and look at the grass and leave. It's really important to spend some time with your livestock, because their behavior will tell you more than anything. If you go out there in the afternoon and they're milling around, and they don't have a very full gut and they're just kind of antsy, that's probably a cue that you need to move them



Dark lines on the top aerial map mark permanent pasture divisions and working pens on Noble's Oswalt Ranch. The map is then marked to show how the cattle will move throughout the ranch during the year. Pokay says it helps them visualize the movements and to plan which pastures to graze more than once that year, where to defer grazing, or graze only once.

regardless of whether you think there's enough grass or not."

As the cattle have adapted to regenerative grazing, their tastes have evolved. "Cows only work as hard as you ask them to. If they have 5,000 acres to graze around, they're only gonna eat ice cream the whole time." So, by limiting the area,

it pushes cattle to seek out and eat more forbs with medicinal and anti-parasitic properties and helps them regain a more natural instinct of what to eat.

ADAPTING TO DIFFERENCES

As mentioned earlier, the physical differences between the Oswalt and Red River

from our ranches

ranches call for different grazing plans and tactics.

Because it's easier to see and to get around with no hills and few trees or brush in the way at Red River, "we can really hone in on how much we want the cattle to have for a certain number of hours and really control the time of day we move them," Pokay says. "It's easier to get around and move the cows there than it is at Oswalt." On the hillier ranch, the terrain makes it harder to move cattle multiple times a day or even daily.

Not that grazing at the river is easy. "We have to plan for shade in the summer, so we'll graze in the pecan orchards." This "silvopasture" approach has the added benefit of providing natural fertilizer for the pecan trees, which tend to be a high-input crop.

Red River Ranch has suffered areas of large wind erosion at times,

but using cover crops to keep living roots in the ground helps. "As long as we can keep the soil from going bare, we can give it enough rest to keep something growing. That's a challenge specifically for the river ranch."

Planting season-specific crops helps maintain a living root and keeps the soil microbiology thriving. In addition, some

of these cover crops can get big, he says. That not only helps feed the cows, "but also gives us something to knock down and put on top of the soil to keep it covered. Bare soil is the enemy." And the multi-species, diverse mix of cover crops, "also increases our plant diversity, which is good for the soil life."

This year's grazing plan for Red River included a new species — sheep. "Sheep graze differently than cows, so sheep will help with the forbs and all those kind of things that come up," Pokay

says. "Plus, it gives us another enterprise to stack on the same acres to help with the profitability."

KEEPING TRACK

To help track profitability and other metrics, Noble uses a cloud-based livestock farm management software system called AgriWebb. It manages data for animal production, pasture movements, health records and feeding records on an individual-animal basis.

"Whenever we move them, we track what our stock density was and animal units per day per acre (total animal units times the number of days grazing divided by the acres), because that will tell us our consumption." Knowing the consumption for each graze lets him compute forage production and recovery time, which informs future grazing planning.

For Noble, knowing performance and cost per animal allows the managers to match animal performance to specific management styles and conditions on the ranches. With that information and ecological site monitoring, Pokay says, "we'll be able to put numbers to regenerative ways to ranch profitably while improving soil health." 🌱

**"AS LONG AS WE
CAN KEEP THE SOIL
FROM GOING BARE,
WE CAN GIVE IT
ENOUGH REST TO
KEEP SOMETHING
GROWING. THAT'S
A CHALLENGE
SPECIFICALLY FOR
THE RIVER RANCH."**

—JOE POKAY



Steers graze a cover crop mix growing in a bermudagrass pasture as part of regenerative ag research at Noble's Oswalt Ranch.

from our ranches

NOBLE RANCHES | COFFEY RANCH

READING THE AIR

ARRAYED WITH SENSORS, one of several remote sensing flux towers is deployed on the Coffey Ranch as part of a \$19 million research project on 60 ranches in five states. Read more in "The Whys, Wills and What Ifs of Regenerative Ranching" beginning on page 26. 🌱



from our ranches

from our ranches

NOBLE RANCHES | PASTURE DEMONSTRATION FACILITY

FRESH FORAGE

LUSH MIXED COVER CROPS greet steers turned into a grazing paddock at Noble's Pasture Demonstration Facility at Ardmore, Oklahoma. 🌿



regeneratively speaking



REGENERATIVE GRAZING

BETTER BEEF WHILE SEQUESTERING CARBON

CNBC PROFILED REGENERATIVE RANCHERS across the country, telling consumers how regenerative grazing helps produce better beef with lower input costs while sequestering carbon. Read how they each came to the philosophy and practices, and how helping natural ecosystems function benefits their operations. 🌱

READ MORE HERE: cnb.cx/3yLWwJo

▶ With regenerative grazing, grasslands grow more leaves and sequester more carbon than monocultural, annual feed crops.

EVERYBODY WINS

GRAZING SHEEP + SOLAR PANELS + NATIVE PLANTS

SEVERAL STUDIES are looking at the effects on soil, plants and livestock when sheep and other ruminants grazed under and around the panels at solar photovoltaic sites, according to PV Magazine USA. So far, it looks to be a win-win-win, especially when the plants are forage species that benefit from the shade and microclimates the panels create. 🌱

READ MORE HERE: bit.ly/grazing-animals-carbon



Allen Williams

DEMYSTIFYING REGENERATIVE GRAZING

In this virtual workshop, Allen Williams of Understanding Ag discusses adaptive stewardship, regenerative grazing and soil health. He covers the foundations of these concepts and shares several case studies from the U.S. and Mexico. 🌱

WATCH THE VIDEO: bit.ly/demystifying-regen-grazing



MAPPING IT OUT

Want to see how widespread regenerative agriculture is? Want to add your farm or ranch to the map? Follow the link to interact with this tool from Regeneration International. Click "Suggest a Farm" to add your operation. 🌱

MAP IT HERE: bit.ly/regen-farm-map

SYNERGY BETWEEN AG AND NATURE

Curt Hogancamp, owner of White Stag Farms in Pennsylvania, says he's seen drastic improvements in his soil, grass and biodiversity from using regenerative grazing and other regenerative agriculture practices. Su Fanok, with The Nature Conservancy's Pennsylvania chapter, is on board, saying the Conservancy uses regenerative agriculture to manage nutrients, improve soil to increase crop yields and improve economic sustainability of farms. 🌱

READ MORE HERE: bit.ly/sustainable-farming-gle



REGENERATIVE CATCHES ON A TOP FOOD TREND IN 2022

TO SHED LIGHT on how cultural and demographic shifts are impacting demand for food and beverage, Hartman Group analysts recently examined six key trends in consumer culture. Top of the list? Regenerative systems and agriculture. As consumers consider alternatives to modern agriculture, they're noticing regenerative systems that restore soil, promote biodiversity and humanize the way food is grown. 🌱

READ THE FULL ARTICLE: bit.ly/regen-food-and-beverage

TRADING SYNTHETIC FERTILIZER FOR SOIL HEALTH PRINCIPLES SAVES \$\$

The only regret Cooper and Katie Hurst have about ditching synthetic fertilizer on the pastures at Hunt Hill Cattle Company is that they didn't do it sooner. "Regenerative ranching has been the best thing we've ever done," Cooper says. "It's taught us to think holistically and that everything is intertwined." 🌱

WATCH HERE: bit.ly/the-hursts-regen-ranching



LAZY JM RANCH

GROWN WITH LOVE AND SOLAR ENERGY

FOUR GENERATIONS of Mobbs live on the Lazy JM Ranch in Hauser, Idaho, where cattle graze regeneratively in a new "cell" that John Mobbs calculates and builds every day. The way his wife, Betty, looks at it, every blade of grass is a free solar panel. "We're not in the cattle business. We're in the solar energy panel business," she says. "After 10 days, our paddocks have all snapped back." 🌱

READ MORE HERE: bit.ly/grown-with-love



2

Podcast Episodes
To Listen To

DOWN TO EARTH
THE PLANET TO PLATE PODCAST

**DOWN TO EARTH:
THE PLANET TO PLATE
PODCAST**

The Sequestration Solution: Soil

Karl Thidemann is co-founder of Soil4Climate, a non-profit that advocates for regenerative agriculture, with a focus on grazing and the restoration of grasslands. In this podcast he makes the case, supported by research, that the restoration of grasslands can provide a multi win-win for soil health, farmer profitability, biodiversity and more.

LISTEN HERE:
bit.ly/podcast-sequestration



THE MODERN ACRE
Regeneratively Raised Meat and Building a Brand with Jamie Ager, Founder, Farmer, and CEO at Hickory Nut Gap

Jamie and Amy Ager built Hickory Nut Gap Farm into a well-established regional brand and a destination that helps visitors to learn regenerative agriculture. In this episode of The Modern Acre podcast, Jamie discusses the story of Hickory Nut Gap and how they are focused on scaling regeneratively raised meat.

LISTEN HERE:
bit.ly/pocast-jamie-ager



READ MORE HERE: bit.ly/RegenAgClassroom

STUDENTS RUN GRASS-FED BEEF BUSINESS AND MORE

Montana math teacher Mark Cassaza turned a side project into his primary full-time job at Whitefish High School — coaching student entrepreneurs through his Regenerative Agriculture class. The juniors and seniors have created businesses including selling micro-greens, marketing grass-finished beef and building a vegetable trailer to use for summer produce. Cassaza's portion of the family ranch at Eureka serves as an outdoor laboratory and training ground for the program. 🌱

BALANCING ACT

REGENERATIVE REALITIES AND REWARDS

REGENERATIVE RANCHERS and educators Meredith Ellis, Travis Krause, Katie Forrest and Taylor Collins talk land, cattle, challenges and rewards in this article from Texas Monthly. 🌱

READ MORE HERE: bit.ly/regen-ranching-profitable



Meredith Ellis of G Bar C Ranch



FFA AND REGENERATIVE AGRICULTURE

The FFA New Horizon magazine lists four considerations for members who want to incorporate regenerative principles in their supervised agricultural experiences. In a nutshell, they are 1. Ask questions 2. Connect with regenerative farmers and ranchers in your area 3. Meet the supporting experts 4. Get creative. 🌱

READ MORE HERE: bit.ly/regen-ag-sae

5

Carbon Contract Questions

Five questions to consider when deciding if that carbon storage market contract is right for you.

1

COMPENSATION

Are you being compensated for implementation of practices or for actual carbon sequestered?

2

PRICE

How is the carbon being priced? Is the price based on metric tons of carbon sequestered or on net CO2 equivalents calculated?

3

PAYMENT

Will your payment vary based on market value, or is it a fixed price at signing?

4

OTHER COSTS

Are there penalties or other costs to you if measured/estimated carbon is less than any advanced payments?

5

RISK FACTORS

How could weather or other environmental conditions (e.g., drought, flood, wildfire) impact carbon sequestration and any associated payments?

VIEW THE FULL GUIDE: bit.ly/soil-carbon-101

REGENERATIVE MINDSET HELPS

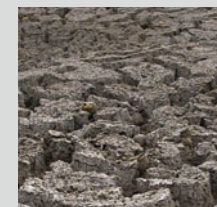
4 PIECES OF DROUGHT ADVICE

FIFTH-GENERATION RANCHER Yates Adcock credits his regenerative mindset and practices for his cattle operation surviving multiple years of Oklahoma drought. Follow the link for four nuggets of wisdom to consider for your ranch. 🌱

READ MORE HERE: bit.ly/drought-advice



Yates Adcock



DROUGHT RESOURCES

We've compiled a list of helpful articles from our staff and other organizations to help you manage your operations through drought periods. Visit noble.org/drought for more information.

SOCIAL MEDIA ACCOUNTS TO FOLLOW

FROM OUR FEEDS

In our social media feeds we have found a treasure trove of regenerative ranching inspiration from peers within our network.



GREEN COVER SEED, INSTAGRAM

Watch the six soil health principles come to life in a brief, engaging video on Instagram.

bit.ly/greencoverseed_soil-health

SISTERS CATTLE CO, TIKTOK

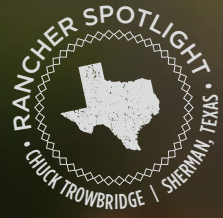
Hobbs Margaret left the L.A. music scene to use cows to improve grassland in Central Oregon, where his Texas-rancher parents had retired. He's approaching 220,000 followers for the regenerative ranching how-to videos on his @fireandsalt TikTok account.

bit.ly/fire-and-salt

1915 FARM, INSTAGRAM

Catherine and Tanner Klemcke grow and market grass-fed beef and pasture-raised pork and chicken on their 1915 Farm at Meyersville, Texas. With 37,000 followers on Instagram, they share farm photos, videos and recipes to stay transparent and connected.

bit.ly/1915-Farm



Stacked for Success

Stacked

for

BY COURTNEY LEEPER GIRGIS

A DIVERSE MIX OF LIVESTOCK adds economic value and soil health on a built-from-scratch Texas ranch.



Steers finishing on grass graze at Prairie Farmstead in Sherman, Texas.



A gathering of red and tan cattle stands in a pasture in front of Chuck Trowbridge's house.



For the second of three daily moves, Trowbridge unrolls the electric fence marking a fresh half-acre paddock for his steers.

They look up from their grazing as he unrolls a strand of electric fence parallel to the one they stand behind. With the new, half-acre paddock secure, the cattle flood into a fresh buffet of green oats, wheat, crimson clover, vetch and ryegrass. It is their second move of the day, with another yet to come.

Beyond a children's playset behind the Trowbridge home, Weiwu, the Chinese guard goose, waddles alongside a flock of red laying hens. They scratch the ground previously grazed by the cattle, helping the soil break down organic matter and leaving behind additional nitrogen. A mobile high-tunnel structure offers the birds respite against the sun and wind and provides a

mechanism for collecting eggs.

Deeper into the woods, a herd of hogs relaxes in the cool shade of pecan and oak trees. Some loll about in the mud. Others root in the underbrush, pulling up vines and sniffing out fallen nuts. Gradually, the hogs are clearing out small trees and opening up the forest floor to grow more cattle-supporting grasses.

While beef cattle may be the pinnacle of the historically blackland prairie where bison once roamed, every animal has its place here on Prairie Farmstead in Sherman, Texas. Chuck and his wife, Molly, started the regenerative farm with her parents, Steve and Carnelia Blazo, in 2017.

Each animal adds another layer of nutrition

STACKED ENTERPRISES

1 Trowbridge raises his chickens on pasture, where they fertilize the soil around the mobile coop that protects them from predators.

2 Seventeen different cover crop species are growing in a test pasture from this mix created with the help of Noble consultant Jim Johnson.

3 The hogs at Prairie Farmstead clear woodland underbrush and add nutrients to the soil as they graze.

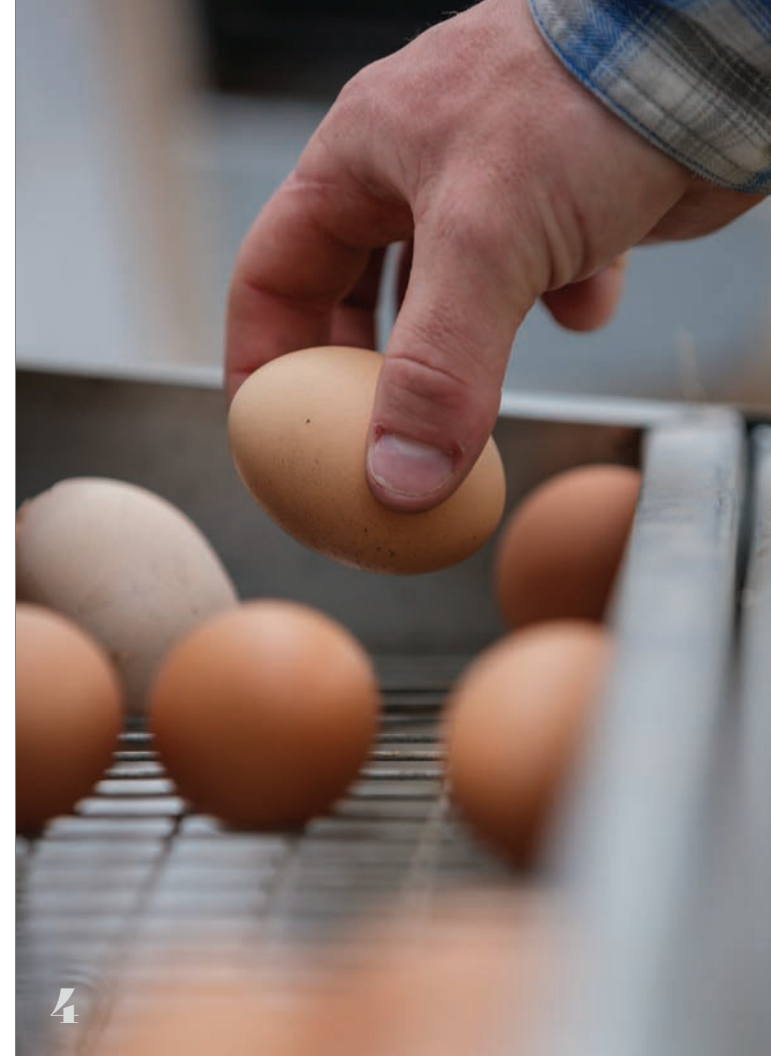
4 Customers can order eggs, beef and pork from Trowbridge through a website service called Eat From Farms.



1



2



4



3



and impact to the soil, making it richer when combined with diverse forages and rested pastures. They also add dollars to each acre with beef, pork and eggs.

The regenerative approach is far from the way Trowbridge was raised. However, it has created a profitable path for him to return to production agriculture and build the life he wants for himself and his family.

FROM DAIRY TO PRAIRIE

Trowbridge grew up on 650 acres of cropland, pasture and timber in southwestern New York, near the Pennsylvania border.

Like many of their neighbors, the Trowbridges operated a dairy. They sold the dairy herd when Chuck was a young boy but continued to support the industry with their small feed mill. They ground farmers' grain into custom livestock feed blends.

Trowbridge also milked cows for a neighbor after school during his teen

years and drove a combine during the fall harvest. In the summers, he made lots of hay.

“REGENERATIVE AGRICULTURE IS A SLOW BALL TO START ROLLING. BUT WHEN THAT BALL DOES START ROLLING, IT REALLY TAKES OFF.”

—CHUCK TROWBRIDGE

Beef cows replaced dairy in the family's pastures. They sold freezer beef as well as pork raised in a small barn on their property to neighbors. Management of the cattle was mostly hands-off. They fed hay more than half the year and

plenty of grain supplement year-round. The idea of moving cattle seemed like a waste of time. Only one neighbor used rotational grazing management, and no one understood why.

After high school, Trowbridge moved to Longview, Texas, to study engineering at LeTourneau University. He met his wife there and followed her to the Milwaukee, Wisconsin, area when she was accepted to graduate school.

Trowbridge wanted to farm again with his dad. He especially wanted to improve their beef operation. So, the couple decided they would move back to New York as soon as Molly graduated. Before they could, however, the elder Trowbridge died and so did Chuck's opportunity and desire to return to the family land.

The farm boy had trouble adjusting to apartment-living in the city, though. A 40-hour week in a cubicle job left him “absolutely bored.” So, he met grain

farmers in the area and volunteered to drive a tractor for them on weekends. He also started reading books about agriculture, trying to find a way to farm without his dad.

Chuck and Molly also connected with the farm-to-table movement booming in southeastern Wisconsin at the time. They ate in restaurants featuring locally grown ingredients and met with the farmers who supplied them. Trowbridge discovered organic and grass-based farming and learned how different people were creating alternative markets in agriculture.

He realized that by serving a niche market of people looking for proteins raised on pasture, it was possible to start a farm from scratch without inheriting land. Going direct-to-consumer would allow him to start small and grow from there. The key would be stacking enterprises or diversifying production so that multiple products could come from one piece of land.

When Molly finished her training in 2014, the couple moved to Texas to be closer to her family. They began watching for available land in the area, and, two years later, found the Sherman property, moving there in 2017.

UNDERGROUND LIVESTOCK

Trowbridge decided to develop a grass-based system that would support beef cattle, chickens and eventually pigs, which were added in 2021. He chose to forego herbicides and insecticides and to minimize use of synthetic fertilizer. His plan, instead, was to build up the land's natural ability to grow nutritionally dense food and increase water infiltration, both of which his research had told him depended on soil health.

Soil tests confirmed he did not have much organic matter in his soil at first. The land had previously been used primarily for hay. Monoculture johnson-grass was sprayed every couple of years for broadleaf weeds, but otherwise received little attention and no grazing. Only a few, sporadic spots of ryegrass grew as winter forage.

At the recommendation of Noble Research Institute, Trowbridge started planting diverse winter cover-crop mixes to increase forage production and soil health. He rented a no-till drill for the first plantings, then he and a friend purchased one off Craigslist. Recently, he began experimental plots of summer cover crops.

Abundant, diverse roots benefit the fungi and other microbes in the soil, which Trowbridge describes as the underground livestock that drive forage production for his above-ground livestock. While the cover crops have been helpful, Trowbridge says his best tools have been the cattle themselves, as well as the chickens.

His cattle move across pastures one small area at a time, typically at least once per day. The chickens also move daily. He follows a yearly plan to graze cattle across the entire farm over the course of the growing season, giving pastures time to rest before they are grazed again. He takes note of rainfall and forage growth and adjusts as needed to prevent overgrazing.

Trowbridge is building a perennial polyculture that eventually will not require annual cover-crop plantings. Getting there will take time, he says, but he knows he's going in the right direction. He has seen native grasses, including bluestems, return and, in the past two years, more production overall.

More forage not only supports more cattle, it shields the soil from the sun. More earthworms have also returned to carve holes into the earth and improve soil structure. Trowbridge can now drive his ATV across a pasture after a rain without leaving deep ruts.

Most excitingly, he says, he found his first dung beetle a couple of years ago. He describes them as nature's way of digesting and burying manure into the soil so that plants can access nutrients more quickly.

“Regenerative agriculture is a slow ball to start rolling,” Trowbridge says. “But when that ball does start rolling, it really takes off.”



3 TIPS FOR RAISING GRASS-FINISHED BEEF

When Chuck Trowbridge started raising beef to sell directly to consumers, he leaned into what he had read and the advice of mentor farmers:

1 Don't start by building a cow-calf herd. Instead, buy stockers first and learn to finish an animal on grass so that it tastes good.

2 Buy calves born into an operation like your own, ready to thrive on grass alone.

3 Market early. Finding calves that met his specifications (no antibiotics, no wormer, no fly control, and no grain or grain byproducts) proved more difficult than Trowbridge imagined. He finally found a group of Angus steers from a ranch in Sulphur Springs, Texas, and has started a network of producers to help each other find the cattle they need for their systems. It's a model he also applies to his pork enterprise.



Local restaurateurs Garrett Nickols and Brad Hammett from Heritage Butchery & Barbecue get a first-hand look at the forage grazed by the cattle and hogs they'll soon serve to customers.

1



2



3

FARM TO PLATE

Trowbridge always wanted to feed people: his family first, including his three children, ages 6, 4 and 1, then, as he could, others in the area.

In his first year, Trowbridge planned to market five steers. He used word of mouth and social media to tell his story. All five steers were sold long before they were finished. They soon added eggs and more cattle for more beef. Last year, they started selling at a farmers market. Talk keeps spreading, and now they supply eggs to a local store and a restaurant.

Most recently, they purchased a website service called Eat From Farms. It allows people to shop online for Prairie Farmstead's beef, eggs and pork, as well as chicken raised by like-minded producers. Purchases can be picked up at the farm, designated drop-off locations or the farmers market.

"I'm not a marketing or social media person at all, but there are tools out there that can help with that," Trowbridge says. "Pay for the tools that will work for you."

FLAVOR FIRST

A soon-to-open butchery-restaurant combo plans to source beef, pork and eggs from Prairie Farmstead. Heritage Butchery & Barbecue (www.heritagebutchery.com) wants to give customers a next-level farm-to-table experience at its Denison, Texas, location. The full-carcass butcher shop will offer custom cuts and meals featuring slow-smoked Texas barbecue and cooked-to-order hamburgers.

"I see cows on bare pastures, while Chuck's got tall grass," says Pete Gonzales, the visionary behind Heritage Butchery & Barbecue. Gonzales grew up in rural communities and wants to see farmers be more profitable. "I see he really cares about the earth and the animals. It speaks to our hearts."

His product also tastes good, says Brad Hammett, a funder for the new business. He has bought grass-finished beef elsewhere, and says Trowbridge's is "hands-down" better. It does not have the stereotypical aftertaste often attributed to grass-finished beef.

What an animal eats in its final 30 days affects the flavor profile of the beef, Trowbridge says. Prairie Farmstead harvests only during seasons with abundant forage, meaning it does not generally make beef available year-round. However, they hope to extend the harvest season to supply Heritage's needs by purchasing both fall and spring calves and feeding some through an extra winter.

A common mistake people make when raising grass-finished beef is harvesting by age rather than animal finish, says Trowbridge. Cattle will be ready at different times, he adds, largely based on genetics and on average daily gain, which varies year to year in a grass-based system.

He weighs the calves at least twice per year and keeps a running list of the order in which he thinks each one will finish. Then he watches how they fatten up. A calf is ready to go when multiple rolls of fat on either side of its tail head jiggle when it walks, as well as when the brisket fills out the neck skin, he says.

It currently takes Trowbridge 24 to 30 months to finish a steer on his forage base, but he anticipates this timeline will shorten as soil health and forage production improve.

"I SEE COWS ON BARE PASTURES, WHILE CHUCK'S GOT TALL GRASS. I SEE HE REALLY CARES ABOUT THE EARTH AND THE ANIMALS."

—PETE GONZALES

Soon, he'll send his third batch of hogs to market after seven to eight months under the trees. The group of 12 came to the farm at eight weeks of age and was trained to the electric fence. A fourth will follow at the end of the year, and the cycle will continue next year.

FARMERS OF TOMORROW

Prairie Farmstead now supports two part-time employees who help Trowbridge manage daily operations while he continues his engineering work. As young farmers themselves, they are soaking up everything they can learn from Trowbridge's journey.

Trowbridge hopes to show young people that agriculture can provide a viable career, especially when focused on improving the soil with help from stacked livestock enterprises and creative marketing. 🌱

TALL-GRASS GROWER

1 Lush forage feeds livestock above and below ground.

2 Steers are harvested by individual animal finish rather than by age.

3 Trowbridge, left, talks with Tucker Nickols before no-till drilling a 17-seed cover crop mix.

MOUNTAIN VIEW

Against the backdrop of Oklahoma's Wichita Mountains, the town of Mountain View is one of many small communities with an important revolution happening nearby — the move to regenerative ranching.

THE *Whys, Wills & What Ifs*

OF REGENERATIVE RANCHING

THE RANCH LIFE IS FULL OF UNKNOWNs, but is there a path to finding the answers? Three ranchers share their journeys with the questions. And one research project seeks the answers.

BY TARA LYNN THOMPSON



Mountain View is a town you don't find by accident. It's 40 minutes south of the beaten path.

You'll eventually run into it, but only after traversing miles of relaxed slopes, patchy grass, lonely fences and a rolling silence you might experience if floating in space.

Eventually, the rhythmic ups and downs of the road make you forget you're expecting a town to pop into view any minute. The quiet is so absolute, the landscape so clean, the peace so inviting, you may find yourself content even if the road goes on forever.

Then Mountain View arrives like a desert mirage. It's the most neighborly smile the sparsely populated land has to offer. It's just there. Just resting. Just waiting to be found.

There's nothing flashy or unconventional in Mountain View, Oklahoma, unless you count Rick's Custom Cycles, a Harley-only repair shop attracting hog enthusiasts from three states to visit the deep, dark bowels of the aging brick building.

The tallest structure in Mountain View is the grain elevator, which at a distance resembles a launch pad readying a rocket. In front, more times than not, a green John Deere tractor or two rests in the shade.

At the single stop sign in Mountain View, turning right leads you to Dollar General or Flowers by Charlene, where locals drink their morning coffee around a table littered with silk flowers that didn't make the cut.

If you need to refuel or make a deposit, turn left.

When lunchtime arrives, you can choose sandwiches and pizza at the Hop & Sack convenience store or sandwiches and pizza at the E-Z Out Drive-Thru with

a side of its specialty: a 54-cent cup of ice. On Sunday, you can park in one spot and choose between the United Methodist Church or the Church of Christ, both immaculately situated as next-door neighbors.

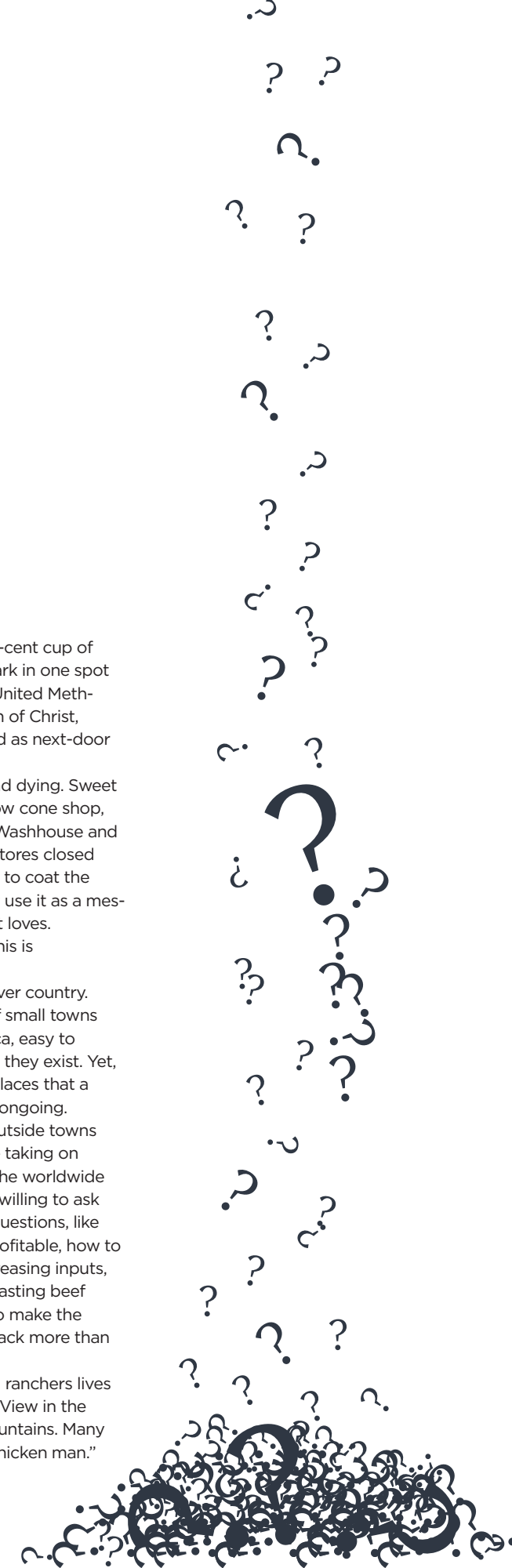
The town is still living and dying. Sweet Treats, a new specialty snow cone shop, opened in May. The Little Washhouse and A Little Of This And That stores closed long enough for thick dust to coat the windows. Local youth now use it as a message board to their current loves.

This is small-town life. This is Mountain View.

It's a quaint town in flyover country. One of many thousands of small towns dotted across rural America, easy to dismiss because few know they exist. Yet, it's in these tucked-away places that a revolution in agriculture is ongoing.

Farmers and ranchers outside towns just like Mountain View are taking on the biggest challenges in the worldwide agriculture sector and are willing to ask seemingly unanswerable questions, like how to keep their ranch profitable, how to build soil health while decreasing inputs, how to produce the best-tasting beef in the business, and how to make the ranching way of life give back more than it demands.

One of these pioneering ranchers lives 10 miles outside Mountain View in the shadow of the Wichita Mountains. Many know him as simply "the chicken man."





Q **HEALTHY ECOSYSTEM: What if this doesn't work?**

Brett Peshek has one of those quick, easy laughs that sounds like he's being tickled. He throws one in between deep ruminations about ranching and the future of agriculture. One minute he's talking about the importance of succession, the next he breaks out in a "hehehe" laugh that makes you laugh, too.

"People call me up and say, 'Hey, I hear that you're the chicken man. Can I buy 100 chickens?' I'm like, 'Yeah. I don't care. Call me whatever you want,'" says Brett, sporting a stylish-without-meaning-to-be-stylish golden-blond beard and curious blue eyes. "You have to have a thick skin a little bit, but the more that people talk about you, whether it's good or bad, the more marketing you get for free."

Hehehe. He started his chicken business with an initial sale of 500 fully mature hens. By next year, he plans to hit 8,000. If his history is any indicator, he'll exceed that number.

"I found it so sad that people were driving three hours away to buy chickens so they could raise their own eggs," he explains. "They can buy chicks from the store, but the problem is they have six months of time and no equipment to raise them before that chicken is actively laying eggs."

Brett saw the need. And filled it. When he has chickens to sell, he notifies interested parties through Facebook, while getting around the social media site's animal sale limits by butchering the spelling from "chicken" to "chikun," "for" to "fur," or "sale" to "cell" like "some backwoods hillbilly farmer," Brett says, and people love it. They laugh. Then they buy his chickens.

Hehehe. This is only one of several income streams he's working under the umbrella of Element Foods. Brett isn't doing only one thing to get his products noticed or to lower his expenses or to enrich his soil. He's doing everything he can think of. He looks at ranching with a mind

toward entrepreneurship that has him raising pigs and sheep, tossing in cattle and moving truckloads of hens. If those products don't bring in the money, he'll try something else.

That's the same way he approaches his soil, too.

On his 640-acre ranch outside Mountain View, this native Nebraska man tests until he finds what works, then repeats and adapts. What has worked, so far, includes adaptive grazing management, minimal chemical inputs and a continual focus on the health of his soil.

Part of his method to building the soil comes through his consistent Haney soil tests and phospholipid fatty acids analysis, along with the all-too-common method of trial and error. One example of trial but not necessarily error was when he attempted to build more residue by planting buckwheat. The buckwheat failed, but he succeeded in getting

earthworm castings into the soil.

"I try to find a reasonable economic experiment for my farm that I do each year," Brett says, while debating whether the

next test will be about mycorrhizal fungi and what would happen if combined with compost tea or earthworm castings.

His other method of determining what works on his ranch is simply walking it and using that insatiable curiosity to spot new forages, insects or pollinators, sure signs nature approves of his management.

"There's some golden prairie clover," he says, while ignoring the glaring 99-degree afternoon heat overhead. He takes a moment to admire the perennial and find its purple cousin. When he comes across a velvetleaf gaura, he stands and pets it while speaking gently, as if it's listening. "I don't con-

"THE BIGGEST CHALLENGE FOR FARMER OR RANCHER IS THE 'WHAT IF.' WHAT IF IT DOESN'T RAIN? WHAT IF IT HAILS? WHAT IF THERE'S GOING TO BE THOSE EVENTS EVERY YEAR, BUT YOU HAVE TO LOOK AT THOSE NEGATIVE EVENTS POSITIVELY."

—BRETT PESHEK



A massive Juanita sphinx moth atop a flowering thistle in one of Brett Peshek's pastures is an example of thriving biodiversity.

IN HIS ELEMENT

Regenerative rancher and entrepreneur Brett Peshek raises hens, hogs, sheep and cattle on pasture at his ranch near Mountain View, Oklahoma. He sells thousands of hens plus meat products through his company, Element Foods.



sider anything invasive. There's uses for all species at different times of the year."

Horny toads are also returning to his fields, along with elusive quail he's always stopping to hear.

"There they are. You hear that?"

Not really.

He mimics the chirping, whistling combo. "It sounds like that." He mimics again, and a chirp/whistle responds. "That's the quail."

Hehehe.

Everything he tries, every test, every new endeavor, is in the search to answer the biggest question that plagues his every working day.

"The biggest challenge for farmer or rancher is the 'what if.' What if it doesn't rain? What if it hails? What if ... There's going to be those events every year, but you have to look at those negative events positively. It's like, well, I see this species showed up this year because of that hail-storm, or we had to feed hay to generate income, so now this spot is fertilized now. The 'what if' is about getting your mindset right," he says. "The climate is one major challenge we face, but the climate's going to do what the climate's going to do. And you can only control so much of that by what lands on your farm and how you manage that rainfall or sunlight."

For Brett, the unknowns are a way of life. He wouldn't mind having more answers than questions, but how to find them?

Across the state, 255 miles east and further south than Brett, at the very edge of what remains of Oklahoma before becoming Texas, is another rancher asking questions, too. And the answers have come at a price.

?
?
?
?
Q

FINANCIAL PROSPERITY:

Why do it that way?

Justin Dow stands in his living room with an Olaf toy from Disney's "Frozen" looking dumbfounded near his foot. Justin is tall and agile, which served him well during his college bull-riding days. Now, it helps him read messages from the International Paper mill, his day job as safety manager, on his phone with his left hand and balance 1-year-old Watson with his right.

Behind him is the family's home-school classroom with "Sesame Street" books scattered around the room next to a clean chalkboard, the game Operation and old-school seating with attached tables. His wife, Jenny, is the teacher. She wears dark glasses on her oval face and has the look of a superhero alter ego. She's already taught their 7-year-old son, Logan, how to write in cursive and is working on doing the same for their twin 4-year-old daughters, Maddison and McKinley, before they turn 5.

Both girls are dressed in their Sunday best. McKinley hides behind her own arm while Maddison explains that her "church dress" has three colors - "pink, light pink and dark pink." It's a pretty dress.

This is the Dows' world. It's their home, their business, nearly their undoing and definitely their future. It's doing a lot for a neatly built, two-story gray rock home situated pristinely on their ranch in Valliant, 80 miles outside of Durant, Oklahoma.

With the simple command of "switch," Jenny swaps Watson for his twin brother Wyatt, plops down on the couch, tosses her waist-length brown hair over her shoulder, and nurses the second twin. Nap time approaches.

This is the juggling act that goes on 24/7, 365 days a year with the Dows. When she's not teaching and caring for their five children or running her dog-breeding business, she's managing the ranch. When he's not keeping 700 employees safe inside the paper mill, he's laboring on their ranch. When was the last time they were alone together?

"We got out on a side-by-side night before last. We had some hay laying down,

and she wanted to see it before it got cut," Justin says.

Jenny, the natural storyteller of the two, gave the details. "I left my 7-year-old to watch my 4-year-olds and my 1-year-olds. And we timed 10 minutes. I said, 'Okay, you have 10 minutes on the clock. Let's go.'"

The assumed slower-paced life of the ag entrepreneur, in reality, is moving at breakneck speeds for the Dows. If Jenny didn't tell you, you'd never know she spent the night up every hour with the boys - they're teething - but still managed to get everyone ready for the day's appointments. And Justin, breathlessly managing work and family life, always makes it to family dinner after getting home each day, but then leaves again for his evening chores.

These are the sacrifices the Dows are making for the life they want as ranchers. It's the life that holds no disillusionments now. Being successful financially in ranching is tough. Sometimes it feels impossible. In 2015, they learned this firsthand.

It was early in their marriage that Justin and Jenny decided to expand. They had roughly 640 acres leased for their small herd and a desire to switch to Red Angus. With the purchase of 46 certified, three-in-ones, they were on their way.

"We paid top money for those cattle," Justin says.

"We paid stupid money for those cattle," Jenny adds.

On what Jenny calls "napkin math," it made sense. They purchased the cows for so much. They'd produce. Their calves would bring so much. The math worked out. On a napkin. In real life, nothing went according to plan.

Out of the 46 cows, only two bred.

"Talk about financial hardship," Jenny says. "When it happened, I stood there crying silent tears."

This young family who grew up rodeoing and working cattle and dreaming of having a thriving ranch of their own were now looking at absolute ruin. No crop. No cash. Seemingly, no way through.

"What do you do?" Jenny recalls them asking.

Yes, what?

"Well, you just fight," Justin says.

"Things got pretty bad. I got the vets involved. I started working with our county

MULTITASKING TO THE MAX

Justin and Jenny Dow with their son, twin daughters and twin sons in the combination cover-crops pasture/milpa garden on their ranch at Valliant, Oklahoma.





A ranch hand moves cows and calves through a unique series of chutes to graze on fresh pastures at the Dows' Rafter JM Cattle Co.

extension agent through Oklahoma State University. At that point, it was more about asking questions. What caused this? Until we knew what caused it, we didn't know how to fix it."

The concept of put-cow-bull-together-get-calf went out the window. There was more to it than that. Even though Justin and Jenny had both been raised around cattle, there was still more to learn.

"Most of the things that went right for us up to that point were luck and just osmosis," Justin says.

"You see things happen. You do it that way. That's the result. You just expect that to be the case, right? But you don't understand all the variables that affect it."

Justin and Jenny got to work learning those variables.

"One of our strongest traits is we're problem-solvers. We like to work the puzzle and figure out how to solve it," Jenny says.

Realizing their cows were in a weakened body condition when they tried the initial breeding, the Dows then changed their focus from breeding to building health. The bulls were pulled, and the cows were deliberately fed for

strength-building. When December 2015 rolled around, their bodies were strong, healthy and ready for a second attempt. Using artificial insemination to support their bull power, the Dows tried again. This time, the breeding succeeded.

Instead of simply taking the win and moving on, Jenny says they asked "why." "We got very inquisitive. We started learning," Justin said. "Up to that point, we had cows because we had cows. It was what we wanted to do, and we thought

we knew what we were doing. Clearly..." Justin opens his hands in an 'obviously we didn't' gesture.

Their curiosity meant driving the vets and extension agent crazy with questions, Jenny says. But they kept asking. Eventually, they learned those 46 three-in-ones that offered so much initial promise were teething, much like her twin boys right now, and physically run-down. That is why the most notorious time for young cows not to breed, she explains, is with the second calf.

Now they understood why they lost money, but they still had to find a way to recover. Napkin math wasn't going to cut it anymore.

"We had to start thinking about finances at that point," Justin says. "Most people in agriculture are not business-minded people. They're production-minded people. You're in agriculture because it's a lifestyle. You grew up that way. It's just what you do. You like doing the tasks. You like being around the livestock. But you aren't businesspeople."

Jenny says there's even pride in that fact. "It's like 'I don't work behind a desk. I'm in agriculture.' And that's true. But it's a business as much as anything else."

She understands that sense of accomplishment and love of the always dirty, often gritty, sometimes miserable, but always rewarding physical work on the ranch. Up until her second set of twins, she did 80% of the tending, feeding and checking on cattle herself, Justin says. She'd load Logan, 3 at the time, and the girls, still infants, and pack them in the feed truck like sardines. Logan was taught how to operate the emergency lights. When his sisters woke up from their nap, he'd set off the lights so that Mom, working the cattle just outside, saw the signal and came.

It worked. And it taught Logan how to do "big brother" well, like keeping his brothers from gnawing on anything they can wrap their fingers around, like raw okra, when crawling through the diverse crop mix of their family's milpa garden.

For the Dows, ranch work has always been their life, but they needed to view it differently now. It had to be profitable, some way, had to dig out.

"We could have given up, but that wasn't an option we considered," says Justin.

While they learned about cattle nutrition and reproductive cycles, Justin also reached out to an area economist to help map out a business plan.

"I'll never forget this. When he first sat down with us and ran the numbers, he said, 'You're going broke.' We were offended by that," Justin says.

Jenny, the more demonstrably passionate of the two, agrees. "I was very offended."

The Dows made changes. They moved toward making their ranch as sustainable as possible. That meant trying rotational, high-intensity grazing that allowed them

to run more cows and have a better supply of grass. It also meant cutting the cost of spraying because weeds were managed through grazing.

The sound of that rotation often overwhelms even the lively chatter inside the house, like it does now.

"They're moving cows," Jenny explains about the noise, nodding her head toward the scene from "Rawhide" just beyond the yard. "We have an alley right there, and it goes to the other side of the road. So, he (the ranch hand) is moving cows from that side of the road to just right by my house."

Outside, the moans and moos of the livestock join with the inside chatter of Wyatt, now awake from his nap and talking all about, well, no one knows what. His quieter brother, meanwhile, is busy dragging one adult-sized shoe across the floor to, well, no one knows where.

Jenny smiles as the cows pass by. "We enjoy it."

They must. Love is required to keep going and to find a way past the questions to the answers, even if tentative or temporary. So far, it's working. The business that started with 35 head on 320 acres of leased land and was managed by a mom and her infants is now roughly 450 head on 1,238 acres of owned land and managed by the Dows and their staff.

How did they keep going?

Justin says by setting up different enterprises, like their cow-calf enterprise, stocker enterprise and custom beef enterprise. And by "squeezing all the juice out of the fruit, if you will."

"The last couple of years have been super tough," Justin admits. "To say, 'Oh, well, you did it and it worked?' I wouldn't say that. I would say every single day is extremely stressful. 'Things are still going to work, right, Honey?'"

Jenny smiles.

Another rancher, stewarding the tenacious soil in the northern Oklahoma plains, has confronted the mental stress of ranching life by combining brotherly love with breakfast food. It's a tasty solution.

PERSONAL WELLNESS: Will I be here next year?

Tom Cannon has been ordering two eggs over-medium with bacon (sometimes crisp, sometimes he wants a variety) at Mary's Grill in Tonkawa for four years. The other four men at his breakfast table usually opt for something different. Bryan prefers Carol's Scrambler, a local specialty of scrambled eggs with spinach and tomatoes. Marty orders French toast. Joe usually goes for something sweet like a waffle. And Gary is the mystery man. No one can ever guess what he's going to order, except maybe Lori, their waitress.

The five farmers sit in the east room, per their usual, and the group therapy begins.

Everyone brings their rain reports and their problems. Whoever got the most rain, pays. Whoever has an overwhelming problem, gets support. Through the years, the issues addressed around a plate of breakfast food have been thicker than the sausage gravy. This isn't the water cooler. This is the priest's confessional and the therapist's couch. They've worked through problems together ranging from divorce and alcoholism to depression and hopelessness.

The only thing demanded at this breakfast, other than coffee refills, is openness.

Initially, when the group started gathering for breakfast in 2018, it was to discuss good production practices. It didn't stay that way for long.

"By our third meeting, it was 'how's your family, how are you doing, are you holding up under the stress?' It was all a support group," says Tom, who describes the comradery as similar to firefighters in a firehouse.

But firefighters are experiencing trauma bonding.

"Exactly," says Tom, flashing a knowing yet still-boyish smile.

He tells the story of his breakfast buddies while relaxing out of the heat inside his "barndominium," an eye-catching two-story structure next to his home in Blackwell, Oklahoma. The adult playhouse offers a full kitchen, two private bedrooms

and private baths, and enough comfortable seating to enchant the most energetic visitor to sit a spell and relax. It's also a favorite spot for Buddy, his son's border collie, who uses his soulful Betty Davis eyes to threaten dogs and charm people.

Part retreat, part escape, the barndominium is a place for the family to recoup on hard days and for friends to claim on traveling nights. It's built, from the outside padded porch swings to the upstairs sprawling couches, for social interaction. For togetherness. For community.

Furry trophies hold their proud heads along the walls, while scripture verses like Joshua 24:15 bring direction and purpose. To seal the deal, a handwritten message of "Smile, Jesus (heart)s you" is scribbled on the whiteboard.

For today, it's the most popular spot on the ranch because it's cooler than the 102-degree day outside. Tom sits at the dining table with two of his children — Jacob and Reagan — flanking him on either side. The dining chairs might be the hardest seats in the place, but the table positions the trail mixes — one sweet, one spicy — within reach, so everyone agrees to sit up straight for a while.

Behind Tom, just over his shoulder, is a window that looks out on the acreage in front of his home. That's the spot where he first learned to till at age 8. Ranching, for him, started early and was inevitable. The Goodson Ranch in Blackwell has been a ranching staple in Oklahoma since the 1893 Land Run. Four generations later, Tom stepped in as CEO.

Even though it was a family tradition, that wasn't his initial plan. In 1997, while Tom was attending college to be a microbiologist, his father suffered a debilitating pickup wreck on his way to an auction in Pratt, Kansas. Tom's future instantly changed.

His family and its 4,000-acre ranch needed him. Tom would need to run Goodson Ranch, but that didn't mean he had to run it the same way.

"I came back to a failing system," says Tom, remembering what he faced when stepping into his new role all those years ago. "The system had been good for a long time, but it wasn't working anymore. Times changed, and our farm had to change."

Seeking answers, Tom signed up for the "No-till on the Plains" conference and the accompanying bus tour to the Dakota

ALL IN WITH NO-TILL

Tom Cannon, CEO of The Goodson Ranch at Blackwell, Oklahoma, examines the blooms on a cotton plant growing on his ranch. Crop residue protects rich soil at his feet, the result of 25 years of no-till cropping.



Lakes Research Farm in South Dakota with Dwayne Beck. It turned out to be a historic moment in regenerative ranching and a historic moment in Tom's life. On the bus with him were men who would become the pioneers in the practice of no-till, men like Dan Gillespie, Ray Ward and Paul Jasa.

"God placed me in this seat where I had Beck, Gillespie and Jasa all around me. We talked, and I just got goosebumps thinking about it because it was so divine," says Tom, rubbing his arms. "I came back and said, 'Dad, we've got to sell everything because I can't afford to upgrade any of our equipment. So, we have to sell everything and buy a no-till drill. One drill. That's all I want.'"

The Goodson Ranch now had a new legacy. Not only would it be designated an Oklahoma Centennial Ranch by 1999, it would also become an area leader in regenerative principles in action.

All with one drill, about which Tom said he "lived in that thing," he covered 10,000 acres per year. For years. But it paid off. Within his first three years of making the change, his wheat yields doubled. Twenty years later, the acreage had more than doubled.

Back then, these no-till guiding principles weren't called "regenerative." They were called "the right thing," he says. "I called it 'I-just-want-to-try-to-grow-commodity-crops-in-the-same-way-that-the-native-grass-in-my-area-is-growing.' I was just mimicking creation in my area."

He used 30 acres of his 3,000 native grassland acres in the tallgrass prairie on the edge of the Flint Hills to test different food plots and grasses at different times to see what worked and what didn't. It also didn't hurt that no one could see what he was trying and judge him if it failed, his son Jacob teased.

"It was incredible what you could do on soils that had never been broke. You'd go in and direct-seed stuff and just see what happens," says Tom, again with the boyish smile. "You can learn a lot from that. I saw things grow in different ways and saw some things that were very surprising."

One year, he tried a small crop of milo with zero commercial fertilizer and zero tillage. The results were shocking. In fact, the results were so shocking Tom took his milo seed dealer up there to see for

himself. The milo seed dealer was also shocked. Tom had grown the best milo crop in the area. A few years later, his milo seed dealer went 100% no-till, too.

"We've been no-till for," Tom pauses to count in his head, "this will be 25 years."

That's a lot of unknowns to have lived through and survived. Out of all the ways he's managed success this long, one lesson stands out the most.

"If I've learned anything, it is how important it is to network with other producers who are like-minded. Anybody wanting to change their operation into a more sustainable operation, No. 1 is network with those that have gone before you," he says, while stopping momentarily to place a quick call to a rancher on the verge of quitting. He knows of three retiring this year alone.

It's this outreach, and the support from men like his breakfast buddies, that get him through the hard years. Hard years like 2022.

"We all knew we had the potential for this year to be the makeup year of all makeup years," says Tom, explaining how, if anyone in farming would pull in \$2-\$3 million in

a year, this was that year. "And it hasn't happened because of the lack of rainfall and high heat."

The high hopes of this year have been met with harsh disappointment. It's these waves of possible feast and ultimate famine that make support groups, check-up calls and the farming community all the more important. But it doesn't stop there. He says, ultimately, it's believing in a power, a loving power, greater than himself.

"It takes a huge amount of belief that the Lord's got your back," says Tom. "You know that the Holy Spirit is going to guide you in your decision-making and that, eventually, all of that works together for good."

That's where his breakfast buddies go for guidance, too. They share a Bible verse at the beginning of every meeting and pray together when all their many different food orders arrive. It's also where Tom is seeking the biggest question for himself, "Will I still be the manager and steward of this land next year?"

He says that answer is going to require divine intervention.

"IF I'VE LEARNED ANYTHING, IT IS HOW IMPORTANT IT IS TO NETWORK WITH OTHER PRODUCERS WHO ARE LIKE-MINDED."

—TOM CANNON

Named an Oklahoma Centennial Ranch in 1999, The Goodson Ranch survived in part by switching to no-till and other regenerative practices.



??
?
?
?

GATHERING DATA:

How do you find the answers?

Outside towns like Mountain View, Valliant and Blackwell, on land you wouldn't notice passing outside your window if the road took you past it at all, is where the land stewards and food providers of the nation are testing new ideas. The state of the soil and the future of the industry demands it. And, yet, the path toward a healthier overall ecosystem, financially prosperous ranches and a lifestyle of flexibility is riddled with constant questions.

It's those questions that have brought together researchers from 11 nonprofit and private organizations, along with public universities, all specializing in environmen-

tal and behavioral science, to unite in one mother-of-all studies. Metrics, Management, and Monitoring: An Investigation of Pasture and Rangeland Soil Health and Its Drivers, called the 3M project for short because even the name is intense, is the most comprehensive study of its kind. It's a \$19 million game-changer kind of study. The kind that has the potential to impact government policy and turn some of the unanswerable questions into statements and struggling ranches into financially thriving operations.

"It's the 'hold my beer' of all studies for grazing," says Jason Rowntree, a researcher at Michigan State University and co-project director for the 3M project. "I'm joking, but it is. We are doing intensive metrics and analysis of grazing management all across the United States."

The "all across the United States" description isn't hyperbole. The study gathers precise metrics on the amount of

carbon in the soil, on the water cycles, on the life and growth and evolution of the ecosystems on 60 ranches in Michigan, Wyoming, Colorado, Texas and Oklahoma.

"I am not aware of any study at this scale, from the Michigan pastures to the diverse rangelands in Oklahoma and the short-grass prairies of Wyoming; adopting the variety and integration of field measurements; literally following carbon, nitrogen and water as they cycle from up into the atmosphere to 1 meter deep into the soil passing through plant and livestock, and coupling this intense field monitoring work with advanced ecosystem modeling through state-of-the-art data fusion; and with socio-economic analyses," says Francesca Cotrufo, a researcher at the department of soil and crop services at Colorado State University who will be studying soil ecology and biochemistry in the project.

It's the breadth and depth of the study

that will provide these 60 participating ranchers, as well as the agricultural community at large, with data to help create informed decisions on the best, most adaptable, most profitable soil management practices.

"The engagement is not just a simple survey or education program," says Isabella Maciel, a systems researcher at Noble Research Institute and co-lead on the 3M project. "We scale up our in-depth metrics across all of the participating ranchers' lands. Then we use this information to create the most advanced modeling for soil health and carbon sequestration, water cycling, forage growth and other metrics."

The comprehensiveness of the study not only extends into the raw soil metrics, but it also addresses the overall well-being of a ranch and ranch family and seeks answers to so many of the questions ranchers pose: How can they make their ranch more profitable? How can it be managed

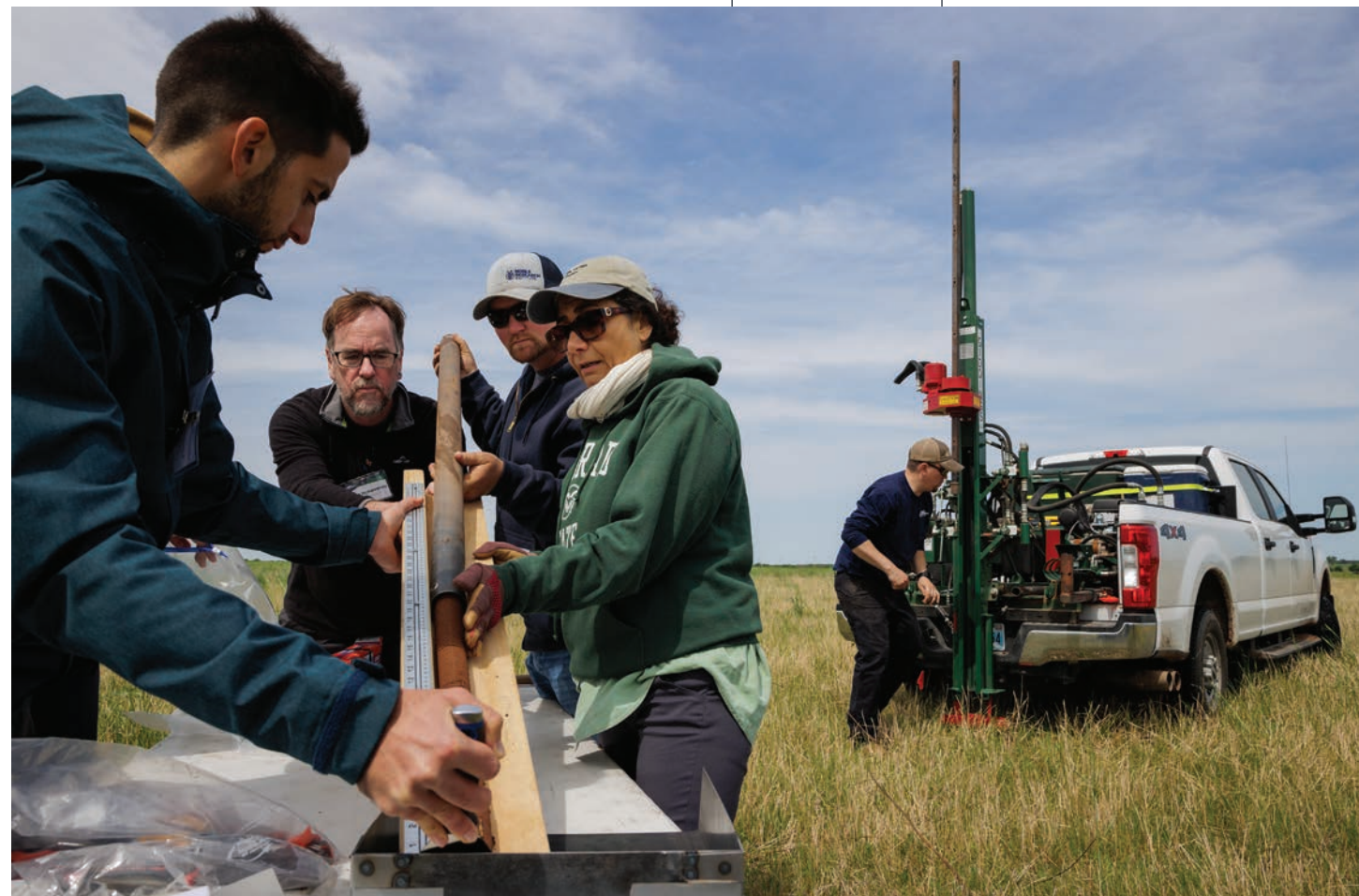
to give them more time? A freer lifestyle? A moment to rest and, like the Dows, have more than 10 minutes on a side-by-side together? Or, like Brett Peshek, offer guidelines that can direct his testing and data collection on his ranch? Or, like Tom Cannon, encourage him and his fellow ranchers to keep going?

"I'm a big data person. I appreciate data, but it can be dangerous, too, when it's out of context. It can give people false hope," says Brett. "You have 365 variables in a year. So, data has to be based on adaptability and what that farm's doing. It's not necessarily what that exact farm is doing, but how they are doing it."

Taking into account those variables is why the 3M study will be a five-year-long gathering of data using the most precise, exhaustive techniques to date. In the end, the researchers hope to find real-world solutions and offer answers to the consistent unknowns in ranching.

"Ranch management often boils down to opportunity costs, whether to hay or graze, sell or retain, destock or grow," Isabella says. "In the future, when ranchers will be paid for the natural capital their landscapes are producing, another set of 'what ifs' will evolve, ones that say 'Do we get more aggressive with stocking rates and grazing intensity, or do we make decisions that work to build more soil carbon, water retention or other metrics? Do we fertilize or not?' But 'what if' we can identify management that gives the best of both worlds? What if the decisions ranchers make that add resilience are the same decisions that also increase profitability due to resilience? That is in a nutshell what we hope to get to, providing information on management and how it is impacting these important trade-offs ranchers face every day."

Those are the questions. Now begins the hunt for answers. 🌱



SENSORS AND CORE SAMPLES

[left] Researchers from several U.S. institutions and universities gather on Noble's Red River Ranch to install and calibrate the first remote sensing flux towers for a five-year, \$19 million study of pasture and rangeland soil health. [center] Francesca Cortufo (in green sweatshirt) from Colorado State University and a team of researchers extract, catalog and store soil core samples for analysis at Red River Ranch. [right] Robert Clement, chief technology officer and co-founder of U.K.-based Quanterra Systems, assembles a flux tower on Noble's Coffey Ranch. These and other specialized sensors on the flux towers will constantly monitor wind speed and direction, carbon dioxide and methane concentrations, precipitation, air temperature, soil temperature and moisture, light and more.

THE
Generous

OF

gift good soil

GET TO KNOW THREE ORGANIZATIONS

whose financial contributions will have a lasting impact on soil health and rancher well-being.

BY KATRINA HUFFSTUTLER



For decades, farmers and ranchers who implemented soil health principles have improved the overall health of their land and experienced more profitable operations. However, these observations have — to this point — been largely anecdotal.

Enter Metrics, Management, and Monitoring: An Investigation of Pasture and Rangeland Soil Health and Its Drivers.

The \$19 million research project, led in part by the Noble Research Institute, is aimed at understanding how a farmer or rancher's grazing management decisions impact soil health on pasture and rangeland and, in turn, how soil health can positively impact a producer's land and well-being.

This critical project wouldn't be possible without generous contributions from The Jones Family Foundation, ButcherBox and Greenacres Foundation.

Their support highlights the important role private philanthropy plays in agricultural research.



THE JONES FAMILY FOUNDATION

Max Jones says it was a no-brainer for him to follow his heart into agriculture, but he knows that's not the case for everyone.

While he grew up raising cattle, the endeavor had always been more of a hobby for his family.

"There was never any contention," he says. "Never any memories of grinding through tough years on grandpa's farm. It was always about joy."

But despite his rather idyllic first exposure to the cattle business, Jones fully understood that ranching wasn't easy. He wanted to learn — especially the aspect of balancing best practices for the environment without sacrificing profitability. Because once he became a full-time rancher,

his days as a carefree cattleman were over. That bottom line meant something. And to him as an outdoorsman, the land did, too.

"We inherently know certain practices are going to be better for the soil health of a system," he says. "But we might lose some gain on our cattle and therefore lose some dollars on certain contracts that we have. Those are areas where I want to be able to reduce that sort of stress or contention."

Through his family's private foundation, he had the opportunity to do just that.

Founded in 2009, The Jones Family Foundation's initial mission was specific to human health and the functional needs of society. But it has evolved to focus on the total health of a community.

"We're now broadening our mission to include promoting research that helps us better understand how our landscapes function and how they are a contributory component of the overall health of our greater community," Jones explains. "In other words, our greater goal is to support research that better identifies and promotes total ecosystem health and function."

But he's more than a donor to this work. Jones helped build the concept in 2019 that would evolve to become Metrics, Management, and Monitoring with Jason Rowntree, professor of sustainable agriculture at Michigan State University, and

On Noble's Red River Ranch, researchers install and calibrate instruments on remote sensing flux towers. Sophisticated sensors collect readings to study how carbon dioxide, water vapor and energy cycle through the ecosystem.



OUR GREATER GOAL IS TO SUPPORT RESEARCH THAT BETTER IDENTIFIES AND PROMOTES TOTAL ECOSYSTEM HEALTH AND FUNCTION.

—MAX JONES



Kye Henington helps sort and process calves at Noble's Coffey Ranch. The calves are part of the Metrics, Management, and Monitoring research project.



Chad Bitler, research scientist at Greenacres Foundation. He's enjoyed seeing the project mature to a point that the Foundation for Food and Agriculture Research awarded Noble Research Institute a \$9.5 million grant in 2021 to help take it to the next level.

Supporting this research is a strong step in the right direction toward quantifying ecosystem function, Jones says, and "therefore tying that piece into total landscape health and how the health profile of that landscape better promotes (or degrades) human health and well-being."

He adds that he thinks the outcomes will be profound and far-reaching.

"I think this will be the real beginning of land managers being able to truly and realistically place a dollar figure on the ecosystem services they are providing for greater community system," he says.

And what's good for graziers is good for the community.

"It's all tied in," Jones says. "It's all for the betterment of the ecosystem. So, what we do at the ranch affects what happens across every portion of the planet. If we are focusing on soil health, water cycling and the energy budgets ... those things have a very broad ripple effect. What is that saying? A rising tide lifts all boats."



BUTCHERBOX

When Mike Salguero launched ButcherBox, the mission was simple: make high-quality, grass-finished beef accessible to more consumers no matter where they lived or what kind of freezer space they had.

But seven years after the first-ever meat subscription sold, ButcherBox is about so much more.

Evadne Cokeh, ButcherBox's vice president of social and environmental responsibility, says the company strives to do everything better — delivering the best meat; supporting farmers and ranchers; caring for the land and animals; and upholding diversity, equity and inclusion across the business.

Their customers have high expectations, and they strive to exceed them.

Recently, Cokeh says that meant focusing on the company's social and environmental responsibility and pursuing (and attaining) B Corp Certification. The designation is awarded to for-profit organizations based on factors ranging from how they treat and compensate their employees to their carbon footprint. The certification is only valid for three years, which makes it not only a mechanism for transparency but for accountability, as well.

"Our business itself is driving toward what we believe is the right future, the right thing to do and the right kind of long-term objectives," she adds.

Cokeh says ButcherBox was thrilled to learn of the Metrics, Management, and Monitoring project and be able to contribute financially.

"I've been really excited about Noble's project because it's so holistic and really mirrors our mission and thinks about what's good for the rancher," she explains. "And I'm excited to see that economic prove-back."

Further, Cokeh says the data that comes from a project like this will allow ButcherBox to better share how loving the planet and loving beef don't have to be mutually exclusive.

"The common perception right now is if you really care about the environment, then you should stop eating meat, particularly beef," Cokeh says. "But when we look at the ranches we purchase from, we see a really healthy ecosystem."

Unfortunately, the studies that have been available to date have been small-scale or only looking at one soil type, she says. But this multi-year study, which encompasses many different soil types across different regions, is different.

"We don't want to greenwash consumers," she says. "We want to be able to prove these claims. And then we'll be able to shift the narrative."

“

I'VE BEEN REALLY EXCITED ABOUT NOBLE'S PROJECT BECAUSE IT'S SO HOLISTIC ... AND REALLY THINKS ABOUT WHAT'S GOOD FOR THE RANCHER.

—EVADNE COKEH

”



“

WE BELIEVE YOU
HAVE TO TELL TRUTHS
AND FACTS, AND YOU
CAN ONLY DO THAT IF
YOU HAVE FOLLOWED
GOOD SCIENTIFIC
DESIGN FROM A TO Z.

—CARTER RANDOLPH

”



Greenacres Foundation staff collect data to measure the improvements after converting its farms to regeneratively managed grazing lands.



GREENACRES FOUNDATION

When the late Louis Nippert bought the first section of Greenacres property in 1949, it was a former corn and soybean farm...and it was spent.

But not for long.

Carter Randolph, Greenacres Foundation president, says the avid environmentalist had a real passion for what Nippert called “pre-1945 agriculture.”

“1945 was approximately the year when the salesman showed up with a 50-pound bag of pellets and would tell the farmer, ‘This replaces 3 tons of that manure you’ve been spreading on your field, and it’s a lot easier,’” Randolph explains.

Nippert wanted to restore the soils naturally, the way he’d witnessed the bison do out West. Of course, bison are notoriously harder to handle, so he swapped in Angus cattle while otherwise applying Mother Nature’s principles. Through regenerative grazing practices, he began to bring the life back to the soil. As he bought more land, he continued managing it with that same mindset.

While the Cincinnati, Ohio, farm was operated more for pleasure than profit, Nippert and his wife, Louise, were passionate about doing things right and sharing the land and their passions with others.

In 1988, wanting to give back to the community, they started Greenacres Foun-

ation with the intent to preserve the land for the education and enjoyment of future generations. Their mission lives on today, serving more than 30,000 students a year, while expanding into new communities.

Combining his love of science and her love of the arts, the couple began inviting school groups to Greenacres to study plant and animal life in their natural settings. To encourage appreciation of music and culture, they added facilities and created an atmosphere that would allow artists to display their talents.

Nippert’s regenerative mindset lives on, too.

The foundation has recently added two more farms, and both are being managed in a way that would make the founder proud.

There are the 450 acres in Brown County, Ohio, that had been in a cycle of plant, spray Roundup, harvest, spray Roundup — and repeat. Now, soil health comes first and staff is collecting data to measure the improvements after converting it to regeneratively managed grazing lands.

And then there’s the operation near Batesville, Indiana, which will be used for both grazing and vegetable gardens. The foundation is monitoring the impact of switching from a traditional grazing program to a rotational system.

“We want to measure the change from putting the cows out and letting them decide what and where to eat versus

bunching them up and us deciding,” Randolph says.

While Greenacres Foundation collects its own data, its leadership jumped at the chance to contribute to a large-scale project like Metrics, Management, and Monitoring: An Investigation of Pasture and Rangeland Soil Health and Its Drivers.

“We believe you have to tell truths and facts, and you can only do that if you have followed good scientific design from A to Z — not from A to B in your analysis of what you’re doing,” Randolph says. We live in a world today where analysis tends to be confined by the length of a Tweet, he says. People “forget that there’s a complex system that we’re working in that requires a lot more knowledge than you can express in 60 words.”

He expects the research truly will quantify the many benefits of a regenerative approach to grazing.

“I’m hopeful the project continues to point to the idea that we need to take full analysis and not just pull out a hammer or whatever tool we have in our toolbox and say, ‘We can solve the problem with this,’” Randolph says. “We need to work with nature and enhance nature, as opposed to confining nature and putting a technology over the top of it and then finding out a few years later we have an unintended consequence that is far worse than what we were originally dealing with.” 🌱

do-it-yourself

IN THE KITCHEN

BBQ STEAK AND ONION PIZZA

TURN LEFTOVER STEAK or any other favorite protein into this quick and easy barbecue pizza from Sheri Glazier.

▼ A balsamic glaze tops off this quick and tasty homemade pizza.



The Dirt Road Dietitian

Sheri Glazier, MS, RDN/LD, is a registered dietitian and an Oklahoma farmer and rancher. With a bachelor's degree in human sciences and a master's degree in nutritional sciences from Oklahoma State University, Glazier uses her education and on-the-job skills as a nutrition consultant, speaker and culinary creator. In 2020, she was named Oklahoma's Outstanding Dietitian of the Year by the Oklahoma Academy of Nutrition and Dietetics. She received the Rising Star Award from the OSU College of Human Sciences in 2019.

Glazier resides with her husband, Kyle, and their two children in rural Oklahoma, where they raise wheat, sesame, hay and cattle. The closest town, Loyal, has a population of 79, which gives her a unique perspective on intentional grocery shopping and preparing meals for families.

FIND MORE RECIPES AT dirtroaddietitian.com



Your favorite barbecue sauce is the base for a pizza that makes use of leftover steak, thinly sliced onion and peppers, plus lots of yummy mozzarella cheese.

INGREDIENTS:

- Pizza dough (homemade or store-bought)
- 1 tablespoon olive oil
- ¼ cup plus 2 tablespoons barbecue sauce
- 1 cooked ribeye, or other steak, sliced thin
- 1 red onion, sliced thin
- 1 green bell pepper, sliced
- 1 cup shredded mozzarella cheese
- Balsamic glaze for drizzling
- Parchment paper to line pizza pan

INSTRUCTIONS:

1. Preheat oven to 425° F.
2. Mix the thin steak slices together with ¼ cup (or less) barbecue sauce.
3. Roll out pizza dough onto parchment-paper-lined pizza pan.
4. Brush olive oil onto dough, then brush on about 2 tablespoons of barbecue sauce.
5. Add the barbecue steak to the pizza, evenly dispersed.
6. Add the mozzarella cheese, a little or A LOT, it's up to you!
7. Top pizza with thinly sliced onion and green peppers.
8. Bake for 15-20 minutes, until crust is golden brown and cheese is melted.
9. If it suits your fancy, drizzle the baked pizza with a balsamic glaze.
10. Serve with your favorite vegetable or fruit side. 🍴

IN THE FIELD

Movable Feeding Station for Guardian Dogs

GOOD GUARDIAN DOGS are essential to the safety of the sheep and goat herds in a regenerative ranching operation. Using a movable feeding system helps keep your guardians' nutrition close to their work as the herd is moved from one grazing paddock to another.



MATERIALS:

- Two 5-foot by 16-foot welded-wire horse panels
- Two 8-foot pre-treated 2x4 boards
- Wood screws
- Self-tapping metal screws
- 83 feet of 2-inch square pipe
- 24 feet of 3-inch round pipe
- One 36-inch piece of rebar
- Four hinges to use on front and back doors
- Two locking latches, one for each door
- 50-pound capacity galvanized dog feeder (Suggested: Pet Lodge Chow Hound automated feeder)
- Two 40-inch by 96-inch sheets of barn tin or corrugated steel roofing material
- 50-pound bag of dog food

NOTE: Finished cage dimensions are 50" W x 96" L x 52" H



4

Things to Consider When Building and Using a Movable Feeding Station

1

Why two doors? The front door helps in training the dogs to use the feeder cage, and the back door gives you an easy way to check and fill the automatic feeder.

2

These portable feeders can be moved with a side-by-side, making them pretty simple to transport as the herds are moved.

3

Our ranch team found the best way to train your dogs to use the guard dog feeder is to bend back a bottom corner of the door of the galvanized feeder. This allows the dog to smell the feed and become interested in pushing the door open.

4

The best way to teach your dogs to use the opening is place them inside the cage to feed, then lock the front and back doors, so they can exit only through the triangular "dog door" opening. Be patient until they're used to the feeder.

INSTRUCTIONS:

Building the cage:

NOTE: The photos show the project made with a goat research cage we repurposed, but you can build a new one using 2-inch square pipe and two horse panels.

1. Construct a frame that is 50 inches wide by 96 inches tall by 52 inches high. We suggest vertical supports in the middle of each long side.
2. Build doors on the front and back with square pipe, hinges and goat-proof latches.
3. Cut the horse panels to size, and then weld to the sides and the front and back doors, but leave the cage bottom open so the dogs don't catch their toenails or otherwise injure themselves. The barn-tin roof will be attached later.



Building the sled:

1. To make the cage portable, make a sled out of 3-inch round pipe.
2. Weld the pipe together in a squared-off "U" shape, with the bottom of the "U" as the front of the sled.
3. The front of the sled should extend past the cage a few inches and be angled upward to make it easier to pull behind a side-by-side or other UTV without hitting obstacles and breaking.
4. After fastening the sled to the bottom of the cage, stitch-weld at intervals along the inside and outside of the pipes to reinforce the connection of the round and square pipes.
5. Make a "U"-shaped pull handle out of rebar and weld it to the center of the front of the sled for use in transport.

Building the dog entrance:

1. In the front/entry door of the cage, build an opening for the dogs — but not the sheep or goats — to enter and exit safely.
2. Start by building a frame out of pre-treated 2x4's to cover the cuts you'll make in the horse panel — one triangle for the inside and one for the outside of the panel.
3. Cut two boards at 26.5 inches for tops of the triangles, and two at 9.5 inches for the bottoms.

4. Cut four boards for the sides at 20 inches, with a 7° angle on the top and bottom of the boards.
5. Assemble the two triangles with wood screws.
6. Locate one triangle in the horizontal center of the entry door, with the narrow side (cut-off point of the triangle) facing down about 12 inches from the ground.
7. Use a pen or marker to mark the interior edges of the triangle on the horse panel.
8. Cut a hole in the horse panel, using an angle grinder or cutting torch to trim the wires about ½ inch back from each mark, so the wire ends will be covered by the wood.
9. Use wood screws to attach the wooden triangles in front of and behind the horse panel, sandwiching the wire and providing a smooth frame to allow the dogs to jump safely into or out of the cage.

TIP: Why the triangle? In past designs, we cut a square opening at the bottom of the panel, but quickly learned that a curious goat can squeeze through a lower opening, especially goats that had been fed dog food before we acquired them! If you only have sheep, a lower square opening would be fine for the dogs.



Finishing touches:

1. Open the back gate and attach the dog food self-feeder to the inside of the gate at a good height for your dogs. We used screws into a block of wood, but the feeder can be attached with wire or other fasteners.
2. Fill the feeder.
3. Attach the roof by fastening the barn tin to the square-pipe frame with self-tapping screws, overlapping the two panels in the middle to fit the cage.

TIP: Adding a roof adds shade for the dogs and will keep the food fresher longer.

before you go

THE FARM

BY J. ADAM CALAWAY

There are few places in the world that touch our soul.

Our modern world tantalizes with distractions that often leave us feeling hollow. The TikTokking of our attention span and the endless streams of entertainment can never replace our need for stillness and reflection.

So, we search. We seek that place where what is drained by this noisy and cluttered life can be refilled. Maybe it's a sandy beach, a rooftop perch or a secret garden. Maybe it's a workshop strewn with greasy engine parts. Maybe it's Dad's fishing hole or Grandma's dining room table. It doesn't matter where or how we find it. It just matters that it's there, our place.

Let me take you to mine. Drive west out of Oklahoma City until the cement and storefronts give away to an endless sea of grazing lands that stretch to the horizon. Keep going. You're not even close.

Drive until the gentle prairie hills are cut by jagged creeks and the horizon is dotted with wind farms that stand like an alien Stonehenge; whooshing blades gathering up the winds that go sweeping down the plains.

Go a little further and you reach a simple rectangle of land that to most passersby seems like a copy-and-paste of the surrounding landscape. Nothing to see here. Nothing unique. Just a

family's entire history.

For five generations of my wife's family, this place has simply been known as "the farm." It's their oasis, and now it's mine.

Here cell phone coverage strains to bring the constant chirp of distraction. Here we come to retreat and rest, to disconnect from the world and reconnect with each other.

Here Hugo clomps up to the fence, nosing your pocket for a treat, more Labrador than quarter horse.

Here a trio of Great Pyrenees dig deep dirt beds into the orange sandy loam and sleep until the baying of coyotes beckons them to their night job.

Here so many of my best

memories have taken shape. Mornings on the porch swing sipping coffee and warming our faces to the rising sun. Afternoons under the pecan trees indulging in the lost art of conversation. Evenings playing dominoes with Grandma, who tells stories of a time we can barely imagine.

Here a gate hangs between the "yard" and the east pasture. I love this gate with its chipped red paint and rusty hinges. I knelt in the sand by this gate more than a decade ago and proposed to the love of my life. And here I return to think. Listening to the two-note call of the bobwhite quail. Watching the summer sun bleach the sky. Considering the big questions of life.

Two years ago, when much of life seemed uncertain, I stood at this gate and listened to the silence. I came to understand my mind and charted a course forward. I came to understand my wife and her love for this place. This farm is not my past, these are not my roots, but this land

is a part of me now. Someday we hope to add a few branches here.

And for the first time I understand my grandfather, a stone monument of a man who — when I was barely old enough to form a memory — stood in a dusty field and looked to heaven praying for rain. Why would he endure such a life? Why would he give so much to the land? Why would he stay?

I understand now. He found his place.

Thousands of ranching families across the nation walk their land not as mere owners of property, but as stewards of a legacy, keepers of holy ground. Yes, it is the place they work, but the farm and the ranch are also their sanctuary, where they commune and reflect.

I've tasted only a morsel of this life, but it's enough to understand that as the rancher tends to the land, the land heals the soul of rancher. 🌱



More than just a place of work, farms are our sanctuaries, where we commune and reflect.



“No *CIVILIZATION* has outlived the usefulness of its soils. When the *SOIL* is destroyed, the nation is gone.”

—Lloyd Noble, Founder

SOIL EQUALS LIFE

Soil is essential for life. Just like the air you breathe and the water you drink. Everything we need starts in the soil. It provides our food. It filters and holds our water. It captures and stores carbon to keep our air healthier. Soil is more than the ground under our feet. It's the foundation of our lives.

Sadly, more than **70%** of the soil is depleted across **650 million acres** of grazing lands in the United States. These lands will continue to deteriorate, undermining our domestic food security, if action is not taken soon.

At Noble Research Institute, we believe farmers and ranchers — the stewards of these lands — are the key to rejuvenating the health of our soil and unleashing the powerful environmental benefits that healthy soil provides.

Our research, education and outreach will equip farmers and ranchers to rebuild soil health across the United States. Revived soil will help the land become more drought and flood resilient, enhance wildlife habitat and store carbon to impact climate variability.

This challenge affects us all, and we need your help! Join us on our journey with farmers and ranchers to regenerate our nation's grazing lands. **Your gift will help ensure land stewards have the knowledge and tools they need to rebuild soil health across the country.** Help protect the soil and all those who depend on it. Please give today.



SCAN THE CODE TO DONATE

Donate now with your credit card using our secure online payment service at www.noble.org/giving

FOR QUESTIONS OR MORE INFORMATION:

P. 580-224-6247

E. giving@noble.org



Noble Research Institute, LLC
2510 Sam Noble Parkway
Ardmore, OK 73401

PLEASE DELIVER TO:

REGENERATIVE RESEARCH

A grazing cow and calves on Noble's Red River Ranch are joined by high-tech remote sensing flux towers. An array of sensors record how carbon dioxide, water vapor and energy cycle through the ecosystem as part of a \$19 million research project on 60 ranches in five states.

