



Hooves on the Ground: A Path to Sustainable Landscape-Scale Water Management

As featured in the report *"21st Century Agriculture Renaissance: Solutions from the Land"*



A few examples of the "Solutions from the Land Pathways" in action...

Who farms this landscape?

Pat O'Toole brings curiosity and an open mind to the way he manages the land, water, and wildlife on his family ranch straddling the Wyoming-Colorado border. He and his family also manage large herds of Hereford and Angus cattle and Rambouillet Merino sheep—a task that depends on healthy pastures and hayfields and judicious use of the snowmelt that feeds the Little Snake River, which bisects the ranch.

The Ladder Ranch, near the headwaters of the Colorado River, has been in the family of Pat's wife, Sharon Salisbury O'Toole, since

Quick Facts: Ladder Ranch

Landscape: 12,000 acres around the Rocky Mountains in Wyoming and Colorado (U.S. West)

Most known for producing: Hereford and Angus cattle, Rambouillet Merino sheep

Also produces pathways to address multiple SDGs: zero hunger, decent work and economic growth, responsible consumption and production, climate action, life on land

1881. Their children, fifth-generation ranchers, follow and refine the rotational grazing practices that Sharon's father pioneered in the 1950s. Pat came on board more

than 45 years ago. He embraced the grazing model, then expanded the conservation ethic with an eye to careful water management. He's philosophical about it.

"Ask yourself what you are trying to achieve on the landscape you're in," he says. "It's about balance. How do I quantify the birds, bats, bees, and butterflies on my ranch? Those have intrinsic ecological value that we haven't been able to put a dollar-amount on. This ranch has all the pieces, but it's about finding the right balance for them."

[Learn more about the O'Tooles...](#)



What pathway does Ladder Ranch follow to not only survive but thrive?

To the O'Tooles, no inherent conflict exists between production and conservation. As Pat puts it,

"We were always taught to keep one eye on the livestock and one eye on the landscape. One does not do well without the responsible management of the other. This is the resource ethic that we try to pass down through the generations."

Ladder Ranch, like many ranches in the interior West, relies on irrigation water from melting mountain snow-



pack. The O'Tooles' holistic approach simultaneously manages for profitability; ecological balance; fish, wildlife and waterfowl; and biodiversity.

Their irrigation practices vary depending on the nuances of each tract of land. They use pivots to water about one-third of their pastures and divert stream waters the other two-thirds. "Flood irrigation," as it's called, takes water from the stream and diverts it into channels in the fields. A series of canvas dams allow sequential flooding of different parts of the field before the water is channeled back into the stream. This "rotational flooding" is an irrigation compliment to Ladder Ranch's rotational grazing.

While flood irrigation is considered less efficient, the "excess" water at the Ladder Ranch is essential to supporting waterfowl and migratory bird habitat. The irrigated land grows hay and grass pasture, which supports the financial bottom line. It nurtures the microbes in the soil, protecting against the effects of drought and filling creeks, streams and springs. It supports trout fisheries and the anglers who seek them. It enhances biodiversity and provides water to wildlife in a migratory corridor. It attracts beneficial insects and pollinators and helps build a beautiful landscape. These benefits illustrate the need for nuanced approaches to water management.

"I call it the myth of efficiency," O'Toole says. In this case, increased irrigation efficiency could hinder other conservation values, a key example of the need for thoughtful

and nuanced approaches to water and land management.

"Grazing is an art as well as a science," O'Toole says. There are hundreds, and sometimes thousands of acres in a pasture. These acres must be managed holistically, with care for the landscape and for hundreds of cows-calf pairs or herds of 1,000 or more so and about 1250 lambs. Herds are rotated to new pastures multiple times each summer across different landscapes, allowing regeneration of each pasture (newly fertilized by the herds) after grazing.

How can the Ladder Ranch be enabled to do even more?

See the list of "High Priority System-Level Actions" on page 18, Chapter 3 of "21st Century Agriculture Renaissance: Solutions from the Land"

According to Pat O'Toole...

"Contrary to popular reporting, managed grazing provides carbon sequestration as part of the carbon cycle. Animal agriculture, especially grazing, provides an opportunity for a sustainable balance of food production and conservation on the ground. Working lands provide multiple benefits. Healthy landscapes are essential to healthy wildlife populations—not only wild ungulates that graze, but also fish, birds and insects.

A key is recognizing that each landscape and watershed is unique. While principles and knowledge gained from generations of experience can be applied

broadly in some instances, there can be no mandated "one size fits all" formula for successfully managing the widely varied ecosystems on earth's rangelands. This is even more true as climate change challenges pastoralists and farmers to be resilient and productive. We must respect the knowledge that has evolved from generations of experience, as people and cultures have learned how to live on the land. We must respect the dignity of work put forth by those who raise our food and care for our landscapes.

The lack of profitability, compounded by the drumbeat of demonization of agriculture and dictation of practices to agriculturists, leads to worldwide barriers for young producers. The real story is that feeding the world is complicated, but dependent upon finding balance among the many moving parts.

Water is inseparable from food production and drought conditions increase, a plant's need for water. Recent articles have suggested that if we remove cows (and presumably other ruminants) from the world, more water will be available. This ignores several facts. The argument calls for shifting water use to other wants and needs. In reality, it is growing cities, industrial demands, and environmental regulations that moves water away from agriculture in the United States, especially in the arid West.

A solution is real support for the building and maintenance of existing and new water storage, and modernization of water delivery infrastructure. This too

calls for a balanced approach, taking into consideration structures friendly to fish, birds and other wildlife. Deceptive practices like fallowing land without planting a drought-resistant, soil-friendly cover crop should not be rewarded more than other examples of innovative production and conservation. The experts are already on the land.

Communities in the Blackfoot watershed of Montana, Little Snake River in Wyoming/Colorado and in Yakima Basin, Washington demonstrate successful projects on the landscape and watershed that are improving soil, improving water quality, improving trout passage and providing other environmental benefits, all using grazing and farming practices to achieve these goals. Landscape-scale partnerships are the key to resource sustainability for both agriculture and conservation values.”

Food for Thought

When farmers and ranchers think in terms of broad goals and principles rather than specific practices, the O’Toole approach managing cattle and sheep on Rocky Mountain slopes and vast Wyoming rangeland can also apply to cornfields and rolling hills in Central and Southeast Ohio.

That’s where David Brandt stopped plowing his fields 50 years ago—reducing erosion through no-till farming—and started nurturing his soil with winter cover crops more than 40 years ago. The cover crops add nutrients to the soil, and the

narrow spaces left by their decayed roots make the soil more absorbent for heavy spring rains. That, in turn, sustains crops during summer droughts in resilient, living soil that can sequester carbon and adapt to changes in climate.

In Ohio, Brandt’s corn, soybean, and wheat fields are not so vast, and his rotations are focused on different crops in each field each year. That’s an age-old model, but the variety of commercial crops has greatly diminished in recent decades to the point that switching among just three, or even two crops is the norm. Brandt strives for much greater diversity—particularly in his use of winter cover crops.

Just as O’Toole says he is still learning after more than 40 years on the ranch, Brandt says he experiments every year with new and different mixes of cover crops. In fact, his fascination with so many different winter plantings has led to a second business: Walnut Creek Seeds LLC, helps him plant the idea of cover crops among other farmers in the region. Seed offerings include grazing and forage mixes among 100 single varieties, which can be custom-blended for farmers.

Brandt advises cover-crop newcomers not to start with complex mixes, recommending instead that they use single species or simple blends to test them in a field and learn how to manage them. Legumes as a cover crop will provide nitrogen for corn planted in the spring, but grasses and small grains are better for fields to be planted in soybeans.

He’s cut fertilizer and chemical costs by as much as 85 percent—and virtually eliminated such inputs in some cases. By recarbonizing his soil, Brandt has decreased his costs and increased his yields. We do a lot of research that is documented daily. To diversity income in an area where competition from housing drives up land costs, the Brandts have ventured into local produce and built two hoop houses to extend the growing season.

In the Shenandoah Valley of Virginia, Joel Salatin produces beef, pork, poultry, and eggs, selling through direct marketing, largely to Washington-area residents and restaurants. But he describes himself as a “grass farmer” because the careful rotation of his animals through the paddocks on his 500-acre farm enhances the productivity of the various grasses on which the entire operation depends.

On the surface, it appears these farmers are doing different things in very different locations. But actually they’re all doing the same things: Managing their water resources, nurturing their soil, adopting regenerative practices that mimic nature, experimenting, learning, sharing, and finding balance among the environment, their own profitability, and their communities. 

[Learn more about integrated landscapes...](#)

- > [Kravitz-Mollor Cranberries, another SfL Story from the Land](#)
- > [The Blackfoot Challenge](#)
- > [Read the full report: “21st Century Agriculture Renaissance: Solutions from the Land”](#)