

Case Study: Climate-Friendly Farming



Burroughs Family Farms

A few miles outside of Denair in California's Central Valley, the Burroughs family works a long, narrow piece of land that has been in the family for generations. The overlapping, continuously growing collection of food and farming enterprises that make up Burroughs Family Farms is run by an overlapping, continuously growing collection of children and in-laws.

The property runs along a dry creek and over low rolling hills. It is spotted with small ponds and vibrant oases of vegetation. The Burroughs' farming ethos places a high value on stewardship because the land is seen as a resource for the next generation. Most of that land is either organic or transitioning to organic production, marking their ongoing progress in a journey begun decades ago.

"My husband and I always had a strong responsibility for taking care of the land and passing it down to the next generation in better condition than we inherited it," reflects Rosie. Ward points out that ranchers in particular have an opportunity to impact the environment, including minimizing their climate impacts. Carbon sequestration on farmlands is a promising method of reversing climate change. "Working ground annually doesn't fix much carbon because you lose it when you till," he says. "But the grass farming business, that's the key."

Unlike the majority of dairies in California that use corn-based animal feed with minimal access to pasture, the Burroughs' cattle receive 80 percent of their nutrition from forage. They use a rotational grazing method called Managed Intensive Grazing (MIG) which allows livestock access to relatively small irrigated pasture areas for short durations, striking a balance between providing adequate nutrition for the animals and a recovery period for the grasses. Research indicates that MIG may enhance soil carbon sequestration, while also avoiding the greenhouse gas (GHG) emissions associated with growing and transporting conventional animal feed.

The Burroughs are also working with a biologist to catalogue the types of grasses found in their managed pastures and have found that sound grazing practices are beneficial to native flora. By allowing native grasses to flourish, the Burroughs also increase soil organic matter, reduce soil erosion, and improve the drought tolerance and biodiversity of their native pasture. This better prepares their operation for changing precipitation patterns and increasingly uncertain weather.

In addition to sequestering carbon in the soil, grass farmers like the Burroughs reduce their overall GHG emissions by using grazing. Conventional beef and dairy operations that confine animals indoors typically emit large amounts of ammonia and methane from lagoons that store decomposing waste and via the anaerobic fermentation process associated with grains that have been chopped and stored in large silage pits. Methane is a potent GHG with over 20 times the climate change impact of carbon dioxide. Grass-based beef and dairy operations like the Burroughs' neatly sidestep this problem, as manure is deposited directly on pastures where it contributes to nutrient cycling as it fertilizes pastures, feeds soil microorganisms and improves soil structure and nutritional value.

Carbon sequestration in agriculture:

The removal of carbon dioxide from the atmosphere by storing the carbon in soils or woody plant material, thereby slowing the effects of climate change.

Some practices that increase carbon sequestration include:

- Cover crops
- Reduced synthetic fertilizer inputs
- Composting and adding organic amendments
- Planting perennial crops, trees or other woody vegetation into rangeland or farm landscapes
- Conservation tillage
- Rotational grazing

Benefits of Managed Intensive Grazing

- Low capital and low labor requirements
- Improved livestock health
- Grass-based diet for the livestock
- High pasture quality by allowing time for re-growth
- Even distribution of manure with minimum labor
- Runoff prevention
- Maintaining the nutrients in the topsoil

Source: Michael Fields Agricultural Institute.
<http://www.michaelfields.org/managed-grazing/>



On the Burroughs' organic fields, they use no synthetic pesticides, fertilizers or herbicides—inputs with significant carbon footprints. They import only manure from neighboring farms that Ward mixes with waste such as paper products and almond orchard “trash” to make compost to increase the soil nutrients and organic matter in the pastures and orchards. As soil organic matter improves, so does overall soil biology. Healthy soil means healthier, more resilient, and more nutritious grasses. As Rosie puts it, “Healthy plants produce healthy animals. Healthy animals produce healthy food.”

The family's land is criss-crossed with French drains, essentially ditches filled with gravel that channel excess moisture and minimize runoff. Water from these drains is collected in holding ponds, and it can later be used to extend the growing season of rangeland grasses—a practice that will be essential in an increasingly water-scarce future. The ponds provide habitat for a multitude of bird species. “Every year we have new birds,” says Ward. “Egrets, red tails, Jensen hawks, swallows, kites. And blue herons! Those are great gopher eaters.”

A couple of years ago, the Burroughs installed a solar array that provide 80 percent of their irrigation pumping energy. “In terms of sustainability, for us that's a big deal,” says Ward. “You know, financial sustainability too.” They also installed state-of-the-art water monitoring systems in the orchards, and the increased efficiency makes a big difference to their bottom line. By generating their own clean energy and reducing their water-pumping energy needs, they minimize their GHG emissions.

Perpetual students and avid learners, Ward and Rosie have spent a lot of time over the years studying ranching best practices and various grazing systems. One of the innovative practices they brought back from their travels is the New Zealand style milking barn, which features open walls and less concrete overall—resulting in lower capital costs and less embedded

energy in the materials compared to conventional barns. The organic transition and other improvements that the family has made over the years have in some cases meant an initial financial investment. But the Burroughs have found that these improvements have also mean less risk over time—especially in a volatile market and an unstable climate. “If our dairies hadn't been organic, we'd have been dead in the water the past couple years,” points out Ward. “When milk took a dive, our organic grazing dairies were the only ones that made any money.”

Ward and Rosie are modest about the fact that the practices they take for granted are at the cutting edge of climate-friendly farming. “In this part of the country, we're one of a few operations doing things like this. But those of us that are, are slowly proving to people that it's working,” Ward says. “And we're lucky,” chimes in Rosie. “I'm not sure what the right word is... Maybe awe? We're just so blessed to have our kids involved and see them really running with this. There's no greater joy than planting a seed and watching that grow.”



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The California Climate and Agriculture Network (CalCAN) is a coalition of California's leading sustainable agriculture organizations advocating for policy solutions on climate change and agriculture. We cultivate farmer leadership to face the challenges of climate change and to serve as California's sustainable agriculture voice on climate change policy.

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