



ROBO RANCHING

Cottonwood Field Station Manager Katie Grott and student Lily McFadden take a break from their work. *Photos by Billy Gibson*

Cottonwood Field Research Station is abuzz with studies designed to increase producer profitability

Billy Gibson

billy.gibson@sdrea.coop

There are robo-cops, robo-codes and robo-calls. But robo-cattle ranching?

That futuristic phrase is part of the nomenclature surrounding a beef production movement called “precision ranching,” an offshoot of the “precision agriculture” approach that promotes the use of advanced technology to improve yields and profitability.

This new wave of ag research evokes postmodern images of bovines grazing through the fields wearing high tech gadgets. Turns out, it’s a description not too far off the mark, according to Dr. Jamie Brennan, an assistant professor of research and extension specialist at South Dakota State University.

Based out of the West River Research and Extension Center in Rapid City, Brennan is using SDSU’s Cottonwood Field Station near Philip to study the viability of using high-tech GPS tracking collars to deliver real-time information on steer activity and behavior.

“By monitoring animal movement we can identify changes in behavior that might indicate sickness, for example, which can be sent as an alert to producers,” Brennan said.

He’s deploying the type of advanced accelerator technology commonly associated with Fitbit watches, vehicle trackers, smartphone map apps and other monitoring devices.

“We’re working to develop the capability for producers to easily identify not only where animals are on the landscape but also where they are selecting for grazing and resting locations,” Brennan said. “The work we are doing at the station is designed to determine the potential benefits - and possible shortcomings - of precision ranching technology and to predict the return on investment for the producer.”

Brennan’s project is just one of several intriguing studies currently in play at the Cottonwood Field Station. One of six field research centers in the SDSU Agriculture Experiment Station network, Cottonwood is among the

oldest facilities of its kind in the country. Covering more than 2,600 acres, Cottonwood was established in 1907 and has received regional and national acclaim with impactful results such as developing a new method of determining stocking rates for western regions and devising the Universal Soil Loss Equation now known as RUSLE2.

These scientific forays into precision ranching include virtual fencing (Vence™), Smart Feeder™ systems, mobile app-based mineral consumption monitors, methane emissions measuring devices and soil moisture monitoring.

The exploration into virtual fencing holds plenty of promise in helping producers manage their livestock and landscape more efficiently and effectively, according to Cottonwood Field Station manager Katie Grott.

While it may be hard for an old-school rancher to envision a world without barbed wire, fence posts and cattle guards, moving this technology to market could result in substantial savings for farm families.

Grott explained the technology is a much more sophisticated version of the kind of residential-grade invisible fence



A cow at the Cottonwood Field Research Station waits patiently for a Smart Feeder to be loaded with hay.

designed to keep pets from wandering around the neighborhood streets. Virtual fencing is already being used to contain goat herds and other smaller animals with measurable success.

The latest research testing involves combining an electrical pulse administered through a GPS-enabled collar, combined with an auditory stimulus to keep cattle confined within certain boundaries. A software program allows the rancher to define those boundaries as needed for successful grazing rotation and land management.

“We’re looking at how virtual fencing affects animal behavior, performance and natural resources,” Grott said.

Dr. Krista Ehlert, assistant professor and extension specialist, is also involved in the project and adds, “Virtual fencing turns physical labor into cognitive labor for producers, helping to reduce labor and potentially improve work-life balance for producers.”

Other projects at Cottonwood include work being led by assistant professor Dr. Hector Menendez. The research uses technology developed by the Rapid City firm, C-Lock. C-Lock has a scale that collects daily weight records on animals every time they drink. The data provide

valuable information on stocking rates, forage quality and weather conditions on individual animal performance.

“It’s an exciting time in the area of agricultural research,” Menendez said.

“We have secured funds to proceed with a project on interdisciplinary engagement in animal systems and precision livestock water monitoring. And we’re excited about holding producer-oriented workshops, training classes and field days to educate producers on how these advancements can improve their profitability.”

One rancher who keeps a close eye on the latest research results is Eric Jennings, president of the South Dakota Cattleman’s Association.

“There are some interesting new concepts being explored through this facility and others,” Jennings said. “We’re watching to see which of these systems prove to become both practical and affordable for producers to implement in their daily operations. For instance, the idea of virtual fencing has been around for a while, but the research and application of new technology has emerged as a viable option.”

Brennan, Ehlert, Menendez and others who work daily to blaze new pathways

Amount of acres
researchers have

2,640

at their disposal at the
Cottonwood
Field Station

for cattle producers take gratification from knowing their labor and application of scientific methods could result in a farm family turning the corner toward profitability and sustaining a generational way of life. Plus, they enjoy drawing students into the process and inspiring the next generation of farmers.

“They receive training in animal science, rangeland ecology, precision technology, modeling, computer programming and boots-on-the-ground ranching,” Menendez said. “One of our aims is to encourage the next generation of professionals that can merge precision technology to maximize rangeland livestock production while maintaining ranching culture.”