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Virtual Fence Technology

Fences tamed the west, or so the saying goes. There is no doubt that the invention and patent of barb wire in the 1870's, forever changed open range grazing and the Great Plains landscape. As a mild history buff and native range lover, I often wonder what it would have been like to have seen the "great American desert" before plows, fences, roads, houses, etc... An emerging technology in fencing has the potential to maybe be as influential as barbed wire was back then - virtual fence.

So, what the heck is a virtual fence? In very simple terms, it is a system that allows a person to draw an imaginary boundary or "fence" around a specific area via a software program & map. This software is coupled with a device, most likely a collar placed around the neck of the animal, that emits auditory and electrical stimuli. The first stimulus the animal receives is an auditory cue when it reaches the virtual fence zone. The second stimulus is a physical shock, similar to that from an electric fence. Essentially, the animals learn the cues that indicate they are close to an area to stop at and the shock creates the stop point. Just like electric fencing, it takes a period of training time to become effective.

Virtual fencing is available for many livestock species, including cattle, goats, and sheep. While functionality is similar, different companies have different options in terms of hardware, software, communication and herd management. For example, there are collars that require battery replacement and others that use solar energy to recharge batteries. Some systems will require a base station communication tower, while others utilize the cellular network for functionality. No one system is the "right" system, so producers who are thinking about this technology need to do their homework and see what is best for their individual situation.

Obviously, there are advantages to adopting virtual fencing or this wouldn't be a technology receiving investment and study. One big advantage is the reduction in need for permanent fence, water installments or other permanent structures; either due to cost, topography or implementation on leased properties. Another is that virtual fencing allows for grazing management in rotational grazing systems, controlled inclusion/exclusion of specific areas - which can lead to ecological benefits, and controlled livestock movement and tracking. Another attraction is that minimal time is typically required to move/check livestock and/or fences, as it is all done through software, instantly available at your fingertips. All of these benefits speak to reduced time, travel, fuel and labor once systems are in place.

There are disadvantages and challenges as well. Whenever a new technology is implemented there is a learning curve and issues to work out, producers need to recognize this and be willing to learn and adapt. Collaring of animals is not a common practice on a typical operation, so the process of fitting the collars, animals adapting to them and maintaining their placement and functionality can all be roadblocks to work through. Retention and containment rates may not reach 100 percent all the time. Poor cellular service, difficult topography for needed hardware, battery life and other hardware or software needs can be challenges. Cost can be a deterrent, but permanent fencing is costly as well!

Research conducted in the past few years has shown promising results for virtual fencing to be a viable option in many scenarios. This technology allows ranchers to track their herds in real time and move them to specified areas within a pasture using computer software. Virtual fencing is a tool to practice rotational grazing, improve water quality by excluding livestock from riparian areas, and reduce the amount of physical fence needs. Ultimately, virtual fencing demonstrates a potential impact on increasing operation efficiency while creating positive impacts on the environment where it is utilized.

The University of Nebraska hosted and recorded a virtual tradeshow around this topic of virtual fencing. Industry and producer representatives for numerous systems gave presentations on their products. If you are interested in learning more about this technology, it is worth the watch.

<https://www.youtube.com/watch?v=oRJcZplrkvI>