

Are You Grounded?

Michael Fisher

Golden Plains Area Livestock Extension Agent

Considering the fact that many crop fields no longer have a suitable fence for maintaining livestock, temporary-electric fencing has become the primary method that many producers use to winter cattle on cornstalks. This has many advantages: it can be temporary, it is cost effective, it's simple to install, it is easy to move or store, and it works (usually). Sometimes, however, an electric fence system can be problematic and cause frustrations for the producer. Many times this is the result of a "short" in the fence, and this is often the first thing producers look for when there is a problem. When the "short" search has been fruitless, I have to ask, "Are you grounded?"

The ground can be one of the most overlooked issues. Even the most powerful of electric fence energizers will be ineffective without the proper ground. Electricity is a lot like a barn sour horse. It really wants to return to its point of origin. That is why it works as a fencing technique. The animal that touches an electric fence becomes part of the circuit as the electricity passes thru the animal, travels in the soil, finds the ground, and returns to the energizer. A poor ground can lessen (or even eliminate) the effectiveness of the circuit. In turn, the fence may not be strong enough to keep animals in. The electricity that is unable to return to the energizer will search for an alternative route and can manifest as stray voltage in places like gate latches, mineral feeders, and water tanks.

Most electric fence energizers will come with directions that state how much ground is needed for that particular energizer. Some are simple. It can be as easy as running a ground wire to an existing fence post. Others may have a formula such as three feet of ground for every joule created by the energizer.

The conditions of your soil can play a major role in your fence's ground. Sandy soil and dry soil are two conditions that are not conducive for a good ground. So let's say that your energizer requires nine feet of ground and the top six feet of your soil is bone dry with the next three feet containing moisture. If you have driven a nine foot rod into this soil have you met the requirement? Nope, you have only met three foot of the requirement. This is because the six feet of dry soil is not going to allow for grounding. You would need to sink three-nine foot rods into this soil condition to have nine feet of active ground.

Another grounding issue can be the diameter of your grounding rod. Electricity in a fencing system moves in a pulse. Therefore, larger diameters of wire will move more electricity. Likewise, a larger diameter of ground rod will allow for more surface area for the

electricity to attach to and move into the ground system. When too narrow of a ground rod or ground wire is used, the electricity can miss the system and will look for an alternative route, once again setting up a stray voltage scenario. It is generally recommended that ground rods be at least one-half to three-quarters of an inch in diameter. Ground wires should be at least as large as the fencing wire, if not a larger diameter.

It is generally recommended that you avoid using aluminum for grounding an electric fence, as it corrodes too readily when placed in soil. Ground rods, wires, and clamps can be made of galvanized steel, copper clad-steel, or copper. Yet, it is important that all of the ground system components be made of the same kind of metal. Both temperature changes and power surges will cause minor contractions and physical changes in metals. However, different metal will react differently. Therefore, when various metals are used in the same system the different properties they exhibit during these changes can promote increased corrosion and reduce the fence's effectiveness.

Finally, a little ground maintenance is required. Annually, take a wire brush to your ground rods, clamps, and wires where the three connect together. This will remove corrosion and rust. This should help to increase the power of your fence. Additionally, you should check your fences power from time to time with a meter.

I hope you find that you are well grounded.