United States Department of Agriculture
NRCS Natural Resources Conservation Service

Electric Fencing

The reliability of electric fencing to contain livestock depends on the appropriate selection of materials and sizing of the energizer and grounding system.

Energizers

"Low impedance" most commonly describes the modern energizer.
Low impedance means the charge pulse length is less than 0.0003 seconds.

Where power is available, it is advisable to use a mains (plug in) energizer.

Joules are the most common means of comparing fence energizers. To compare energizers using joules, the pulse lengths must be similar and the resistance levels must be comparable. Ratings range from 1 to 20 joules.

Manufacturer recommendations range from ½ mile to 6 miles per joule

- Depends on type and quality of fencing
- Single strand out of vegetation - several miles per joule may work
- Multiple strand fences in heavy vegetation - less distance per joule

Experience at the University of Missouri Forage Research Center has shown that allowing one mile of fence per joule output is satisfactory in most situations.

To control most livestock, maintain fence line voltage of at least 3,000 volts. Use higher voltage for sheep, hair goats, and predator control.

Grounding Systems

An electric fence energizer is only as effective as its grounding system. Three factors determine grounding system requirements.

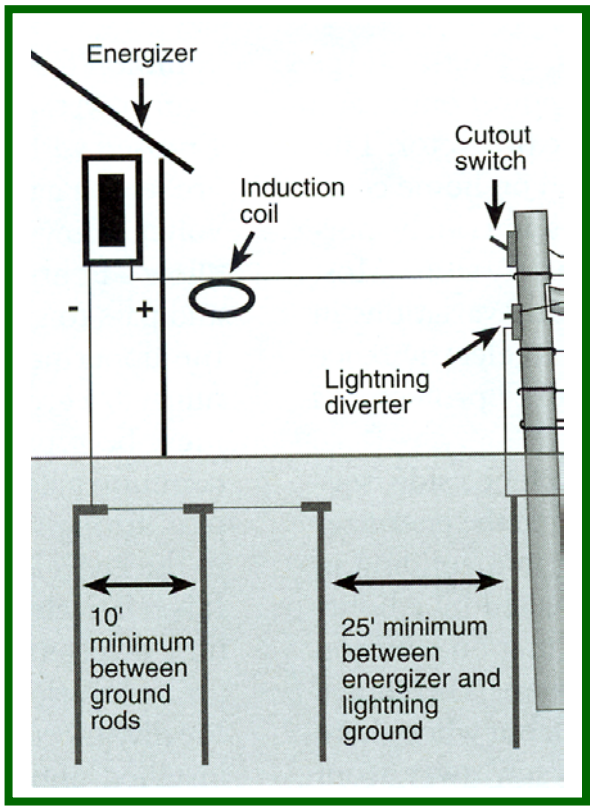
1. Output capacity of the energizer
2. Conductivity of the soil
3. Type of livestock or predator being controlled

Guidelines:

- Install a minimum of 3 feet of ground rod/ per joule of output
- Use galvanized or copper ground rods
- If the energizer terminal is
  - Galvanized - use galvanized rods and wire to the energizer
  - Stainless steel - use copper rods and wire
- Do not mix copper rods or wire with other types due to electrolysis
- Ground rods are 1/2 to 5/8 inch in diameter and are 6 to 8 feet long
- Drive rods full length into the soil for maximum soil moisture contact
- Place rods at least 10' apart (north side of a shed under the drip line is ideal)
- If conditions prevent driving full length into the soil, then lay ground rods in a trench as deep as possible – placement becomes even more critical
  - Locate in an area that remains moist year around
  - Drip line on north side of a shed
  - Low-lying wet areas

"**Earth return" fence system:** alternate wires are either electrically charged or non-charged (serve as part of the total grounding system).
All ground wires lead back to the ground or earth terminal of the energizer.
Touching two alternate wires brings the full impact of the grounding system to bear.
Consider using this system if:

1. The soil has poor conductivity (sandy or rocky)
2. Predator control is the primary use
3. Controlling sheep and hair goats



The effectiveness of an electric fence depends in large part on an adequate grounding system.

Source: Missouri Grazing Manual