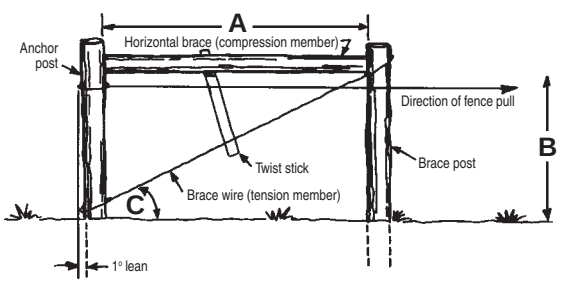
Fencing Options

The goal of fencing is to facilitate the management of the livestock herd. The type and design of a fencing system will vary with the type of animal and the level of management. Boundary fences should be constructed to a higher standard to minimize liability concerns associated with livestock leaving the property. Although cross fences should be designed to properly contain livestock to the prescribed pasture, they may be constructed to a more economical level (i.e. one to two strand electric fence vs. four strand barbed wire).

Options for fencing include barbed wire, two strand smooth wire, single strand smooth wire (energized or non-energized), temporary or permanent electric (energized) fence, woven wire and electric mesh. Choice of fencing will depend on the animal type and/or class of animal to be controlled and the producer's objectives or comfort level.

Corner bracing

Properly installed corner brace assemblies are the cornerstone of any fence. Fences with



poor corners generally require more maintenance and have a shorter life span than those with well designed and installed corner braces.

The key to properly installed corners lies in understanding the relationship between the length of the cross brace (A), the height at which the cross brace is installed (B) and the resulting angle formed between the brace wire and the ground (C). To be effective, the length of the cross brace (A) must be at least twice the distance at which it is installed from the ground (B). Maintaining this relationship will ensure that the angle between the brace wire and the ground (C) will be 30 degrees or less. If this angle is greater than 30 degrees, the pull from the fence wires will tend to lift the back post out of the ground.

Tip: Experience and research indicates that a corner brace assembly with a brace post at least 8 feet long mounted approximately 4 feet off the ground is the minimum design criteria for an effective corner assembly. For a stronger corner, one fencing contractor recommends installing a brace post that is at least 2.5 times as long as the top wire is from the ground. For example, if the top wire is installed at 48 inches, the brace post would need to be at least 120 inches long.

Energizers (fence chargers)

Low impedance vs. high impedance energizers

Impedance refers to the amount of restriction manufacturers place on the flow of electricity (amperage) exiting the energizer. Energizers with a long spark duration and high amperage have the potential to start grass fires and injure or possibly kill anything caught in the wire. Therefore manufacturers install resistors into these types of energizers to reduce the amperage thereby reducing the potential damage. These types of energizers are termed “high impedance.”

High impedance chargers tend to short out easily because their amperage has been reduced.

Low impedance energizers have been designed with a much shorter spark duration. This shorter spark duration eliminates the need for reducing the amperage with resistors, hence the term “low impedance.” Because these chargers operate with a higher amperage, they are less likely to short out on weeds or other items that may come in contact with the fence. They are safe to operate with this high amperage because the spark is extremely short in duration (usually around 0.0003 seconds).

Tip: For most animals, the generally accepted optimal voltage range is between 2,000 and 6,000 volts. The more or thicker the hair on the animal, the greater the required voltage for control.

Comparing energizers

Most companies rate their energizers by the "Miles of Fence" standard (Minding Your Fences. March 1977. Thomas K. Cadwallader. Pasture Prophet. Vol.5, No. 1. Grazing Lands Technology Institute). Energizer A will charge 10 miles of fence versus energizer B which will charge 15 miles of fence. However, this standard does not take into consideration the weed loading or the electromagnetic resistance that occurs in multiple wire fences. To obtain an accurate comparison of energizers, you need to determine the amount of amperes (amps) that each energizer is generating. To do this, you need a basic understanding of the following electrical terminology and how to use this information to compute the amps each energizer generates.

Tip: Amps (Amperes) are a measure of the "amount" of electricity that flows through the circuit. It is the amperage, not the voltage that causes the greatest amount of numbing pain and potential damage when anything receives a shock.

Tip: Watts are a measure of the electrical rate of doing work. It is a unit of electrical power that is similar to horsepower. It is calculated by: Amps x Volts = Watts

Tip: A joule is a unit of electrical energy equaling the amount of energy required to produce one watt for one second. Joules are calculated by: Watts x Seconds = Joules

Tip: Pulse time is the length of time the fence is "on." May also be referred to as "spark duration."

Tip: An example to evaluate energizers: We can evaluate energizer A and B using variations in the above formulas.

Energizer A is listed as a 4.5 joule unit that can maintain 5,000 volts under low weed pressure. If energizer A's pulse time is 0.0003 seconds, then we can make the following calculations:

4.5 joules/0.0003 seconds = 15,000 watts
15,000 watts / 5000 volts = 3 amps

Energizer B is also a 4.5 joule unit that can maintain 5,000 volts but has a pulse time of 0.0006 seconds:

4.5 joules/0.0006 seconds = 7,500 watts
7,500 watts/5,000 volts = 1.5 amps

As you can see in this example, energizer B produces only one half the amps of energizer A

due to the difference in pulse duration. Energizer B is actually only a 2.25 joule energizer.

Energizer grounding

Lack of an adequate grounding system on electric fences is one of the most common causes of ineffective animal control. Follow the energizer manufacturer's recommendations for proper grounding. Generally, proper grounding requires at least two; half-inch galvanized rods at least 6 feet in length driven entirely into the earth. Grounding wire from the energizer should be securely attached to these rods using the proper fastener.

To check the adequacy of your ground system, you will need a digital volt meter (DVM).

Testing the ground system

Before testing your fence's grounding system, you will need to place the fence under a heavy load. You can do this by resting several steel stakes (steel fence posts work well) on the live wire(s) of the fence at least 330 feet away from the energizer. Keep adding stakes until the fence voltage is reduced to 2 kV or less.

Using the DVM, measure the voltage between the energizer's ground wire (the wire attached to the negative post on the energizer) and an independent grounding rod placed at least three feet from the energizer's grounding rods. If the reading on the DVM is greater than 200 volts, then more grounding rods are needed. Add permanent ground rods to the energizer's grounding system and repeat measurements until proper reading is obtained.