



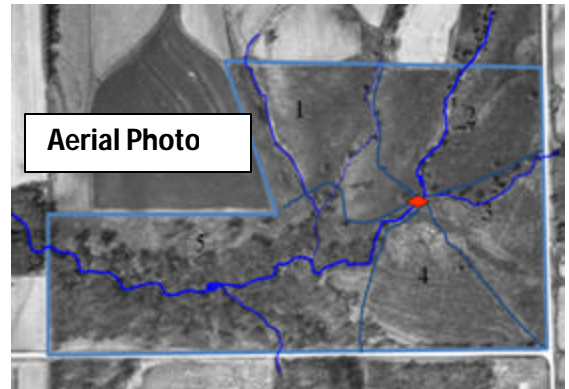
Planning Sheep and Goat Fencing (February 2010)

For Improved Animal Control and Reduced Predation

Good Fences: Control Animals, Enhance Managed Grazing and Reduce Predation.

- 1) **Animal Control** – Keep sheep and goats on your property and where you want them to be. Puts you in control of what, when, where and how much they eat.
- 2) **Makes Managed Grazing Work** – Allows smaller paddock sub-divisions for short grazing intervals, forage rest periods and improved harvest efficiency. Improves grass utilization and reduces forage waste.
- 3) **Reduced Predation** – Properly constructed and maintained electric fences may provide non-lethal control of predators such as coyotes and dogs.

Plan ahead: Read supplier information, University and NRCS materials to design your grazing system. Make a scale drawing(s) on an aerial photo. Use transparencies and erasable markers to identify perimeter and subdivision fencing, water sources, stream crossings, etc. Make a detailed bill of materials needed for fencing supplies. Shop around compare quality and price. Negotiate prices on a per box, case or pallet lots.



Types of Fencing:

A) **Permanent** (*Perimeter Fencing*)–

Woven Wire - 2" x 6" stays prevent animals sticking head through the wire. Animals may get caught in a 6" x 6" stay fence. Offset electric wire may reduce the problem. 6" x 12" stays allow animals to insert and remove heads without being caught. An additional electric top wire is often installed in woven applications. Woven wire is available in regular and hi-

tensile strengths. (\$.50 to \$1.90 / ft.) Closer post spacing increases the cost of a woven wire fence even more.



6x6 stays w/ Electric top & lower offset

Barbed Wire – Available in both regular and hi-tensile strengths. Wire cost \$.035 - .11/ ft. Multiple strands are needed to control sheep or goats. *Do not electrify barbed wire!* Animals or people can become entangled, injured or killed. Voltage is lost to poor conduction and parasitic loss.



Barbed Wire

Smooth Hi-Tensile – 5-10 Strands of Hi-Tensile, 42-52 Inches tall is recommended for controlling sheep and goats. Electrified (5 to 7 strand) fence with alternately charged and grounded wires for added control and predator reduction benefit. Wider post spacing reduces the overall cost. 12.5 gauge Smooth Wire – Cost \$.02 -\$.05 / ft. Use spinning jenny for wire control. Wire breaking strength ranges from 170,000 psi to 210,000 psi. Stiffer wire is stronger but harder to work with. Connections can be made by hand tied knots or with crimp sleeves. Hand tying connections are easier with 170,000 to 180,000 psi wire.



12.5 gauge Hi-tensile 7-wire fence

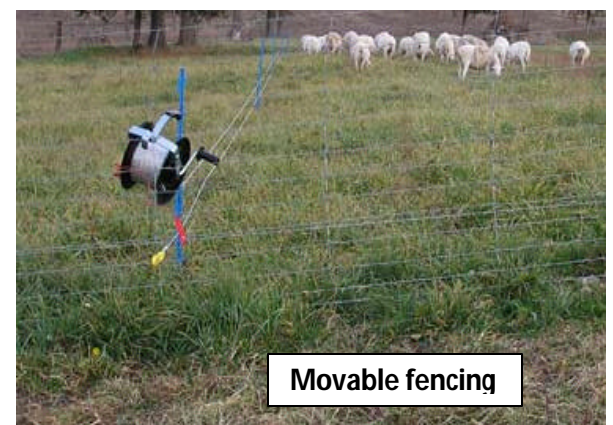
B) **Semi-permanent** – 2-3 Strand 12.5 gauge Smooth Hi-Tensile (*Paddock Sub-division Fencing*) Carries a greater electric energy flow and longer life than smaller wires or temporary fencing options



3 wire Semi-permanent paddock sub-division

C) **Temporary or movable** – Interior Paddock Fencing: 2-3 wires

Poly-Wire, Poly-Tape and Poly-Rope: Buy Quality – Products vary in Conductivity, Visibility, and Durability. High strand count (6– 9+), interwoven conductors are preferable for conductivity and durability. Poly products vary in UV light degradation. Product life is 2-3 years under heavy use. Poly-wire costs \$.01 to \$.03 / ft. Poly-Tape and Poly-Rope may have greater visibility. Tape costs \$.02-.045 / ft. Rope prices are \$.06-\$.15 / ft.



Movable fencing

Movable Netting: Used for small areas or short sections of fence. Electric netting cost \$.63 - \$1.25 / ft. May have conductivity and durability concerns with heavy use. Increases labor cost.

Zinc coated cable: Easy to roll up or unroll, may be more costly (\$.06 / ft.), but has a longer usable life expectancy and greater conductivity.

Low Impedance Energizer: Don't skimp here! Make sure you have enough power for your farm situation. Size and rate your energizer with reputable suppliers. Energizer costs range from \$80 to \$1,300 or more based on size and type. Minimum species voltage for animal control: Cattle 4-5,000v; Sheep 7-8,000v; Goats 7-9,000v; Horses 3-5,000v; Predators 5,000v; Pets 3,000v; Garden Pests 4,000v; Wet vegetation or snow load will reduce power.

Mains (120v) energizer – Usually delivers more power reliability for the money. Mains energizers are available for larger systems

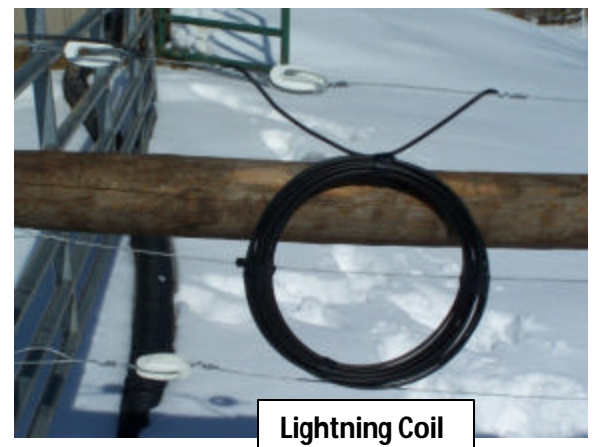
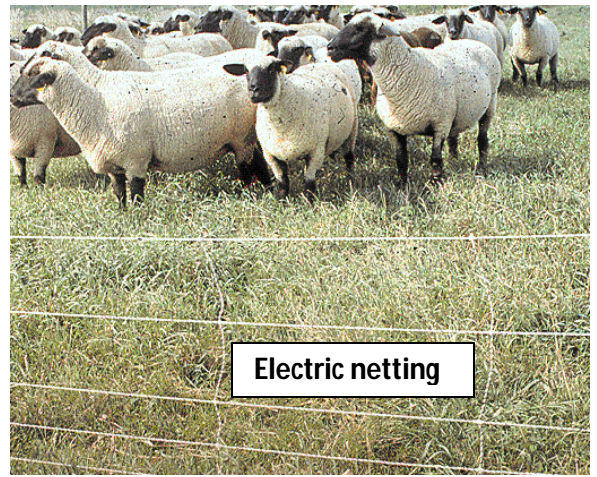
Solar/battery energizer – Portable, can be used in areas without electricity supply. Solar battery charger will increase the battery life and reliability.

Grounding: A minimum of 3 ground rods placed 10 ft. apart near controller. Mixing metals (steel & copper) causes corrosion and weak shocks. Copper wire and rods can be used from an energizer with brass connection. Or use galvanized wire and galvanized ground rods. Additional ground rods may be needed throughout the system.

Surge and Lightning Protection: Energizers are expensive and fundamental to your electric fence system. Install a surge protector on the AC power line. Protection is also necessary on the fence side: a lightning choke or coil between the energizer and fence, diverter on the fence side including 4 ground rods (a minimum 65 ft. from the charger). Construct a lightning coil of 10 to 12 wraps of insulated 12.5 gauge galvanized wire. Each coil should be 8" to 12" across.

Posts: Should be the strength of your system not the weakness. Select good quality posts designed for the application

Corner Posts: Use 8 foot treated pine post in 5"- 7" diameter depending on the type of fence. Agricultural grade posts (CCA treated) are preferable to landscape timbers. Post size is depended on the type of fencing installed. Comparable strength post made from other durable materials may also be suitable.



Line Posts: Line post can usually be of small diameter and shorter than corner post. They should be long enough to reach below the frost line and above the top of the fence (often 5'). Post made of non-conductive materials (wood, fiberglass, plastic/wood resin) are preferable for electric fencing applications.

Wood posts 3" – 5" are the traditional post for fences. While considered non-conductive, insulators should still be used on electric fence applications to prevent parasitic energy losses.

Fiberglass posts are available in a variety of sizes. New material post made specifically for fence applications can be found as small as ½ inch diameter. Recycle oil field "sucker rod" post available in 7/8 to 1 ½ inch diameter make good line post and interior post. Care should be taken to select post with good exterior seal coats for better service life. Fiberglass posts usually do not require insulators for electric fence applications. Frequently holes are already drilled through the post for attaching the wire hangers.

Plastic/wood composite made from recycled plastic and wood are among the newer products for livestock fencing. They can be a cost effective option. Check the manufacture specifications for strength and durability. Some designs are more for decorative applications; others have been designed for heavier applications.

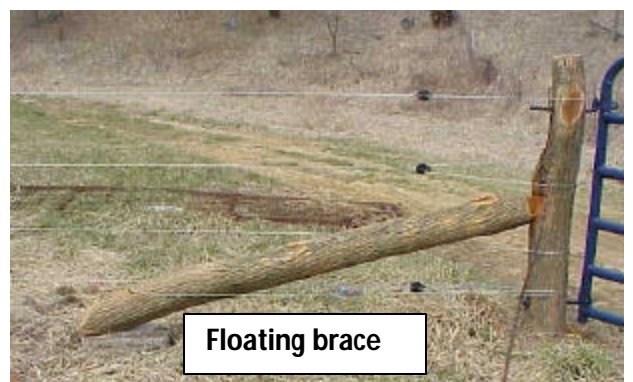
Metal T post are a traditional option for barbed wire and woven wire fencing. T post are less desirable for electric fences as they require insulators and may easily ground out fences.

Corner bracing is an important part of constructing a durable fence. The two common types of bracing are H-brace, and Floating brace.

H-brace - Two corner posts set 8 to 10 ft apart with a brace rod between them, near the top. A tensioning wire or rod should be pin-connected between the top of the second post and the base of the first post. A double loop of 12.5 gauge wire and a tensioner can be used to tension the assembly. An H-brace should be used in the fence line on long runs (>650 feet). Add a second tensioner assembly from the opposite corners for an inline application.



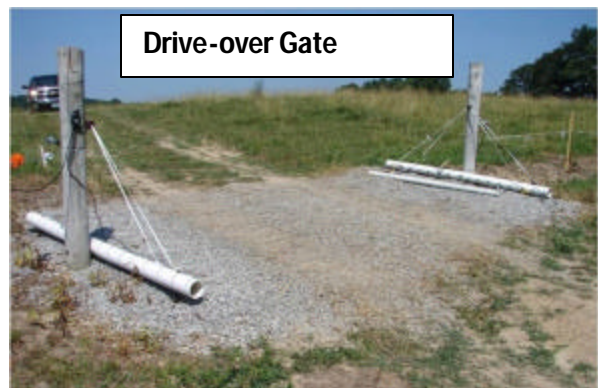
Floating Brace is an option to strengthen a corner, gate entrance, or other post that could move due to the load applied. In general, this is an excellent option for interior fences with limited number of wire strands. A brace post is connected to the corner post at (or just below) the top wire with a pin connection and the other end setting on block on the ground. The brace should be about 2.5X the height of the top wire in length. A threaded rod or double loop of 12.5 gauge wire should be tightened between the ground end and the bottom of the corner post.



Water gap - an electrified water gap can be the easiest way to create an animal barrier over a waterway, creek, or stream. A stand of 12.5 gauge wire (or fence cable) stretched above common water line with strands hang down to just above the common water line is an inexpensive water gap. The hanging strands can be high tensile wire, cable, chain, metal conduit pipe or other appropriate electric conducting materials. Other materials such as plastic pipe can be intermixed to add to the visibility of the barrier. Breakaway connections and flood gap controller (to prevent water from grounding out the fence) are options where severe or prolonged flooding may occur. .



Drive over Gate: Add convenience for frequently used entryways. A drive over gate can be built from plastic pipe, high tensile wire and small springs. 12 or more strands of wires are stretched between two plastic pipes through holes spaced 6-8 inches apart. A small spring is attached to each strand to keep it tight. The plastic pipe is secured to the central post and at the ends. Additional insulated material can be placed under the strands to help keep the wires off the ground.



Temporary Posts: Plastic and fiberglass tread-in post work well with Poly wire, poly-tape, or poly rope for temporary electrified fencing applications. Insulators are usually not required. These vary in design, strength and durability.



Plastic tread-in post – Consider the size of the metal spike, the design of the wire/ tape loops, and the flexibility when selecting plastic post. Larger spikes may keep the post more upright during use, but may require more effort to insert and remove from the soil. The tread-in step should be on opposite side from wire loops and large enough for ease of installation. The wire loops should be designed for easy attachment and removal of the wire or tape, but still be secure while in use. More flexible posts tend to be more durable.

Fiberglass post - are available in smaller sized for temporary applications. Care should be taken to select post with good exterior seal coats for better service life. Clips may be need to attach wire or tape to the post. Some may have molded wire/tape loops and tread-in steps. Make the same considerations as with the plastic post.

Equipment/Tools needed will vary based on the type of fence, materials selected, and installers experience. The following is a partial list of recommendations from the authors.

Safety glasses and gloves!!!

Spinning jenny to control high tensile wire feed out

Crimp tool or Wire twist tool

Crimp sleeves

Wire cutter and/or Fencing pliers (design to cut high tensile wire)

Staple driver.

Staples

3/8 inch brace pins

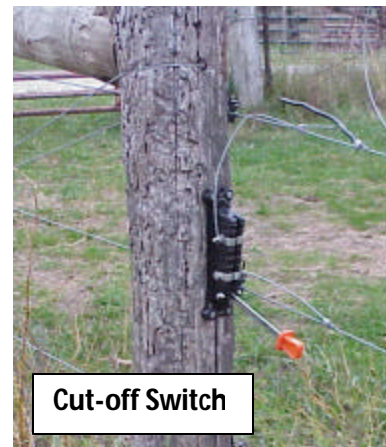
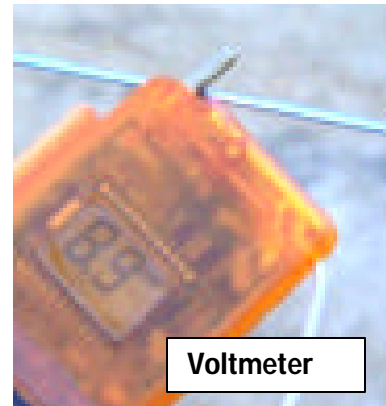
Drill and bit for brace pins.

Wire stretcher for woven wire, and barbed wire

Strainers and springs for high tensile wire.

Digital Voltmeter to accurately evaluate your fence.

Switches to isolate part of the fencing system for repairs or to reduce load under snow and weed pressure.



Resources:

Electric Fencing for Serious Grazers – Missouri NRCS publication

www.mo.nrcs.usda.gov/news/pubs_download/out/MO%20NRCS%20Electric%20Fencing_low.pdf

Estimated Cost for Fencing www.extension.iastate.edu/Publications/FM1855.pdf

Fence Posts and Wire extension.missouri.edu/publications/DisplayPub.aspx?P=G1191#fence

High-tensile Wire Fencing NRAES -11 www.mwps.org (Construction tab)

Planning and building fences on the farm www.utextension.utk.edu/publications/pbfiles/PB1541.pdf

Maryland Small Ruminant Page - Fencing www.sheepandgoat.com/fencing.html

NRCS Illinois Conservation Practice Standard: Fence (382)

Partial Listing of Fencing Suppliers:

kygrazers.com/kgshop

www.twinmountainfence.com

www.speedrite.com

www.gallagherusa.com

www.powerflexfence.com

www.premier1supplies.com

www.kencove.com

www.pasturemgmt.com

Cost estimates are provided for comparison purposes only. Reference to specific websites or companies or trade names does not imply endorsement by the sponsors or speakers, nor is discrimination intended against any that are not listed.