Fencing Systems for Rotational Grazing

Post Selection

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Post Selection

It has been said the first thing to plant in setting up a managed grazing system is fence posts. Regardless of how you lay out your pasture system or the materials you use, the fencing system starts with setting posts in key spots around the property. Unlike woven wire or barb wire fences, high tensile electric fences are flexible systems that are allowed to move with changes in physical pressure on the fence caused by any number of things; such as changes in temperatures or trees falling on the fence. Nearly all of the tension on these types of fences is on the ends and corners where fences start and change horizontal direction, and on hilltops and in valleys where they change vertical direction. All other posts just help hold the wires apart and/or off the ground.

Wood versus synthetics

As natural materials, such as wood go up in price, new synthetic materials come in to take their place. Wood is still the most prevalent type of material used for posts in the critical structural portions of the fence but fiberglass and some new plastic materials are becoming more common. Figure 1 shows a fiberglass brace assembly that is being used in a three wire fence. One of the weaknesses of a fiberglass system is the lack of flexibility in construction. Wood can be nailed into, cut and shaped in any number of ways while fiberglass has to be put together as they are engineered. Synthetic materials such as fiberglass also need to be manufactured so they resist breakdown from ultra-violet (UV) light. They may last for several years but if they aren't protected from UV rays they can begin to break down and become more brittle. Also, if fiberglass posts aren't solid they may not have the strength to absorb shocks.

Figure 1. Fiberglass corner post

Dug versus driven posts

Although post drivers can make the job easy, in some locations they may not work out very well. If there are lots of rocks to contend with and it's important to put a post in a particular spot, posts can shift from one side to another in the driving process. They can also break if they hit large rocks or bedrock. Another reason to dig a post in would be the opposite reason. The ground is very loose and the posts will need some help to stay in the ground. But outside of those reasons driven posts are much quicker and easier to put in

and the driving process actually helps hold them in the ground better.

Treated versus Untreated

Regardless of whether you are going to dig or drive a post in the ground it's important to put a post in the ground that will effectively resist rot for at least 20 years. Most of the above ground materials on the market today can last at least that long and having the system fail below ground is a waste of time and money. The natural resistance of several wood species to decay is listed in Table 1. If the decision is to go with treated posts the recommendation is to go with pressure treated products. Figure 3 lists some of the different treatment products. The pressure forces the treatment products into not only the sapwood but also the more difficult to penetrate heartwood area.

Life Expectancy of Untreated Wooden Posts (heartwood)	
Wood	Untreated Life (years)
Cedar (1" growth)	20-30
Tamarak	10-15
White Pine	8-12
Douglas Fir	7-12
Birch	5-10
Willow	5-8
Ponderosa Pine	4-14
Lodgepole Pine	4-12
Spruce	4-6
Popular	3-5

Table 1

Oil-borne Preservatives. These are not water soluable

- Creosote – effective, low cost, noncorrosive to metals; stron odor, oily, irritating to the skin, can leach out of post
- Pentachlorophenol – penta or PCP; environmental concerns limit use
- Copper napthenate – green cuprinol
- Sinc napthenate – clear cuprinol

Water-borne Preservatives. These are water soluable.

- Chromated coppuer arsenate – CCA; does not leach out once dried in post
- Ammoniacal copper arsenate – ACA; does not leach out once dried in the post
- Copper sulfate – Bluestone; will leach out of post reducing effectiveness

Figure 3 Wood treatment products

Natural versus mechanically rounded posts?

Naturally rounded posts are basically small trees. Mechanically rounded posts are usually taken from larger trees that are quartered and then rounded off. Naturally rounded posts are generally preferred for a couple of reasons. First, the concentric rings of the natural posts add to the strength of the post. And secondly, round posts take preservative treatments more evenly. A quartered post generally has more heartwood on one side than the other and heartwood doesn't take preservatives as well.

What about the density and grain?

Density means the mass of wood for the given dimensions. For posts that are dug in, the denser the wood the better. Post strength can increase as there are more rings per inch. Even though post can vary in strength from tree species to species, within a given species the more rings per inch the better. Figure 4 shows two different posts of the same type of wood and treating process. Both posts measure approximately the same diameter, the post on the left has about 20 years of growth while the post on the right is has more than twice that. The post on the right is heavier than the one on the right and the additional rings make it a stronger post. If you're using a machine to drive posts in, than the post on the left may be the one to choose. It is less dense but it is also more flexible. Posts that are more flexible will bend before they break if they are driven into ground that has rocks or are difficult to penetrate for one reason or another.

Figure 4 Wood posts

How long should they be?

The deeper you can put a post in the better but if you're limited to how deep you can put a post in the ground then there is no sense wasting wood. For livestock fencing eight foot post are the standard but seven foot pots will do the job just fine if you can get the post in the ground at least three feet. In northern areas the recommendation is usually to get the post below the frost line. Three feet is usually adequate but under the right conditions the frost can definitely go down deeper. For posts that are used as braces against horizontal forces use at least 8 foot posts.

How big around should the posts be?

Post diameter will depend on what you are asking it to do. Figure 5 shows the relative strength of different diameter pine posts so a post should be sized in order to handle the tension that is being asked of it. For most fence systems corners and ends should be at least 5″ in diameter. Posts are usually sold by the diameter measurement at the top of a post. The posts in Figure 4 are both 5″ top posts. Figure 6 shows a post that is tapered with one end being 4″ and the other 5″. This is called a 4″ top post even though it runs from 4″ at the top to 5″ at the bottom. If you were going to bury this post you'd put the large end in the bottom of the hole to help hold the post in the ground. If you were going to drive the post in you'd

do the opposite for the opposite reason. The post will getter tighter as it is driven in. Brace and line posts that aren't being asked to carry the load of the ends and corners can be a smaller diameter. Four inch top posts are adequate for either of these applications. The other possibility for horizontal or diagonal braces would be the 4.5" landscape timbers shown in Figure 7.

Figure 1.6 Tapered post

Figure 7 Landscape timber

Do they need to be straight?

Although it is common to select wood for straightness, posts with a bit of a bow may have places they can be used. But like any construction project, it's much easier to start out with straight wood to work with.

Here's what to look for in selecting posts for the fences foundation:

- Naturally round posts
- Pressure treated
- At least 5" diameter tops for ends and corners
- At least 4" diameter tops for braces
- Preferably straight
- 7-8 foot in length
- For dug in posts, high density, tight grain
- For driven posts, lower density, open grain
- At least 8 foot post for diagonal or horizontal braces