

Fencing Systems for Rotational Grazing



Bracing

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Bracing the ends and corners

There are lots of different methods that have been used for bracing the ends and corner posts so they won't tip over or pull out of the ground once the wires are fastened on and pulled tight. If there isn't much tension on the post just burying it in the ground good and deep and backfilling with the right kind of material may be all that is needed; but even then, over the years the constant pull of the fence can pull a post over. And if tipped far enough it won't belong before it starts to come out of the ground. We're going to cover three ways to brace end and corners that will work under most fence systems intended for keeping in domestic livestock; H and Floating braces for multi-wire fences, and a bed log brace for single wire or low tension fences.

The H Brace:

The H, or horizontal, brace has been one of the most common brace designs in multiple wire fence construction for years (Figure 3.1) Whether the horizontal brace support is put at the top or more towards the middle of the posts the principals and effect are still the same. Where it is placed is a matter of personal preference for reasons other than the strength of the brace. The brace has four different parts: the end or corner post that is being braced, the brace post that assists the end or corner, the horizontal brace that connects the two posts and the brace wire that ties the top of the brace post back to the bottom of the post it is bracing.

Where do you put the brace post?

One of the challenges of working with H-braces is you don't have much flexibility on where they can be put. Not only do they need to be lined up with the fence and they also need to be far enough away from the post you are bracing to make them effective. Generally they are placed somewhere between 8 to 10 feet away, depending on the horizontal brace you've chosen to work with. Eight-foot posts are most commonly used for the horizontal brace mainly because of their availability. If it is easy digging putting the brace post in isn't a big problem but in rocky terrain it can make putting it where you need it to go a bit of a challenge.

There are two measurements that need to be taken. First line the post up between the ends and/or corners that the fence is going to be stretched between. One of the easiest ways to do this is to stretch some twine between the posts and use it as your straightline. Next, lay the brace down to set your distance. If you run into rocks you may have to compromise on where to put the post. Better to go a little bit further out than too close in.

Does the distance between an end or corner

and a brace post make any difference on strength?

As far as strength goes, it's always better to go a little longer in distance from the post you are trying to brace. Eight feet seems to work just fine for most situation, but if for some reason there is more than normal tension expected than it may be better to put in a second brace post creating a double H brace than going with a longer brace. These are usually more common in taller multi-wire fences, such as deer fence

Is there any difference between putting a brace post in compared to an end or a corner?

Not really. Since the brace posts aren't going to be carrying the load that the ends and corners are you can usually get by with a slightly smaller diameter post but they still need to be in just as deep since they also need to stay put in order to be effective. If you are digging the posts in they still need to be backfilled properly but it's usually not necessary to put anything on them to keep them from pulling out of the ground. The forces on the brace post usually help keep them in the ground. If they are being driven in there isn't any difference at all.

How should the horizontal brace be fastened in?

There are a few different ways that are commonly used to fasten the horizontal braces to the end or corner post and the brace post. One of the most common ways is to use a combination of notching and nailing. The end or corner posts are notched with a saw and the brace is placed in the notch. Once the brace is in place it can be fastened to the posts with a good nail; such as six inch, tempered steel, galvanized, ring shank nail, commonly called a pole barn nail.

Another commonly used method for attaching the brace is with brace pins. Brace pins are usually quarter inch diameter pins about 5 inches long. A hole is drilled in the end of the brace and the side of the post and the pin is slipped into the two holes. Although brace pins can be used in conjunction with notching many fence contractors forgo notching altogether and depend entirely on the brace pin to keep the brace in place. What keeps everything together is brace wire.

How is the brace wire installed?

The brace wire is the thing that makes the whole system work. It runs from the top of the brace post to the bottom of the post that is being braced essentially tying the top of the brace post to the ground using the post that is being braced. That's the reason the end or corner needs to be good and sturdy. The more pressure that is put on it by the fence wires the more force that is exerted to the brace wire reaching back to its base.

Here again there are several ways to install a brace wire. What is shown is a high-tensile wire system that is wrapped twice around the posts and tightened with a fence strainer. Start by putting two staples neat the top of the brace post on the opposite side of the brace. Put two more staples into the end or corner posts a couple of inches from the ground also on the opposite side from the brace. Go twice around the brace assembly twice with a single length of wire, feeding it through the staples. After you make the second loop cut the wire so the ends are just past each other halfway between the two posts. Install a fence strainer and tighten the wire up. Tighten the wire slowly pulling it periodically to make sure the tension is equal along the entire length. Stop tightening when the top of the end or corner post begins to be pushed back by the brace.

Figures 1 – 4 show some of the steps in building an H-brace.



Figure 1 Corner post



Figure 2 Drilling hole to attach brace support



Figure 3 Attaching brace support



Figure 4 Tightening brace wire

The Floating Brace

The Floating brace is a fairly new concept in brace design and has become very popular in electric fence construction. One of the

major advantages of a floating brace is it only requires digging one hole. If you're working in ground that is easy to dig in it may not be that important, but if rocks and clay soils are a problem then only having to put a single post in the ground is a real plus. As far as strength goes, there is not much much difference.

There are four basic components of a floating brace: the post that is being braced, the brace, a brace wire and the brace pad. The only thing that is permanently fixed is the end or corner post that is being braced. Everything else is flexible and allowed to move with the changing conditions that the fence is put under. The brace assembly works by directing the force that is put on the end or corner post down along the brace right into the ground and back through the brace wire to the bottom of the buried post. It is called a floating brace because the brace pad is "floating" so to say on top of the ground.

Where should the brace be placed on the post it is bracing?

The brace is usually mounted on the post it is bracing anywhere from 30 inches from the ground to the top of the post. Assuming we are working with a multi-wire fence, there are a couple of factors that determine the height. The first would be the placement of the wires themselves. Since the most common multi-wire fence is a three wire fence, the top wire is generally 39-40 inches high, the bottom wire is generally 8-10

inches off the ground and the middle wire, of course is somewhere in between. This means the most of the wires are at or below the brace if it is set at 30 inches.

The second thing to consider is the length of the brace. An 8 foot brace set at 30 inches and a 10 foot brace at 48 inches achieve nearly identical angles, 30 degrees from the ground to the brace and 60 degrees from the post to the brace.

How should the brace be fastened to the end or corner post?

As it was with the H-brace there are two methods commonly used to attach the brace to the post, notching the post and fastening the brace to it and using brace pins.

Notching –

For notching simple measure up from the ground to the desired height that the middle at the brace will be set at and, if you are using a 4-5 inch diameter brace, mark 2.5 to 3 inches on either side of it. With a chain or a hand saw cut into the post at the marks about a half inch deep. If you are using a chainsaw carefully use the tip of the chain saw to smooth out the area between the two cuts. If you use a handsaw for making the initial cuts a hammer and chisel will work just fine.

After the post is notched then the brace needs to be cut to fit into the notch. But before cutting the brace can be cut to fit in the notch if first needs to have the end that sits on

the brace pad smoothed off so it sits flat on the pad.

Now we can cut the brace so it fits into the notch on the brace. Start by setting the brace on the post pad and into the notch. Next, use a straight edge to mark the proper angle to cut the brace at. Cut along the mark), set it back into the notch and then fasten it with a 6 inch tempered and galvanized ring shank nail, commonly called a pole barn nail. Once the brace is set into place and lined up along the fenceline then it's time to tie the whole thing together with the brace wire.

Brace Pin –

The only thing that is different about a brace pin assembly is the notch itself. The brace and its placement are all measured and cut the same but instead of cutting the notch, a holes are drilled in the brace and the post and a brace pin is inserted to keep the brace in place. The weakness in this system is that over time the brace pin can split the post if enough force is applied.

How is the brace wire installed?

The brace wire is an extremely important part of the floating brace system. Some of the original floating brace systems didn't even depend on brace wire but chose to use a threaded rod to act in place of the brace wire. But with the high tensile wire and strainers available today a brace wire works just fine.

The process begins by installing two galvanized fencing staples in the end

of the brace and at the bottom of the post being braced to help keep the brace wire in place. The brace wire is then fed through the staples two times. The brace wire is cut so the ends just run past each other about halfway between the post and the end of the brace. Next a fence strainer is installed. But before the wire is tightened slip staples over the staples placed in the brace and the post between the wire and the wood. These staple help keep the wire from cutting into the wood.

Once the staples are in place, slowly tighten up the brace wire by turning the ratchet on the fence strainer and pulling up on the brace wire to make sure the tension is even along the entire length of the wire. Only tighten until the top of the post is pushed back slightly. Finish the brace off by tamping the soil around the post one more time.

Figures 5 – 13 show some of the steps in building a floating brace.



Figure 5 Smooth end on pad



Figure 6 Placing notch



Figure 9 Attaching brace wire



Figure 7 Cutting brace



Figure 10 Attaching brace wire



Figure 8 Attaching brace



Figure 11 Adjusting brace wire



Figure 12 Tightening brace wire



Figure 13 Floating brace

The Bed Log Brace

The Bed Log Brace is by far the simplest brace system for bracing and end or corner post. Although it won't hold up to the tension put on it by multiple wire fences it is ideal for single wire high tensile fences, multiple wire fences that are hand stretched or even to assist in situations where a fence may be making a gentle bends where an H or floating brace may not fit in.

Where and how deep should the bed log be put in?

To install a Bed Log Brace start by determining which direction the force will be coming from and dig a hole deep enough to have the top of the bed log a couple of inches below the ground. Figures 14 and 15 show both two different types of wood being used as a bed log. Either will work but something with a flat edge will work better because it will need to push more dirt in order to get it to move. Do not attach the bed log to the post it is bracing. At ground level it will just act as a tool to help heave the post out of the ground. The Bed log isn't intended to keep the post in the ground but to keep it from being pulled over.



Figure 14 Deadman post support



Figure 15 Deadman post support

Should the native soil be used?

The answer to this question is the same as it was for backfilling a post. If it is sand and/or gravel type soil go ahead and use what you've got. But if the soil is more clay or silt it's better to use a sand and gravel mix.