

## *Lesson 3: Barbed and Woven Wire Fences*

---

### **Lesson 3: Barbed and Woven Wire Fences**

Barbed and woven wire fences are common in agriculture. This lesson describes the basics of building these two types of fences, including the materials and tools needed and the process of installing the wire.

#### **Materials and Tools for Barbed Wire Fences**

The materials needed to erect a barbed wire fence are barbed wire and staples or metal clips for attaching the wire. Barbed wire is fencing material made of wire strands twisted together with wire barbs placed at various intervals. The main characteristics to look for when purchasing barbed wire are gauge, number of barbs, wire coating, and type of wire. Barbed wire is manufactured and sold by gauge, a number representing the diameter of the wire. A lower number corresponds to a larger diameter. The most common gauges in Missouri are 12½ and 14 gauge. The configuration of the barbs on the wire will vary slightly by manufacturer, but two and four points are the most common. Barbed wire will usually be coated with zinc or aluminum to help it resist rust. Both coatings are effective, but aluminum will last longer under most circumstances. Barbed wire comes in either soft wire or high tensile wire. The wire is fastened to posts using either staples for wood posts or specially designed metal clips for metal t-posts.

Usually fences will use only wood or metal posts, but if the land is relatively flat and free from rocks, they may have alternating metal and wood posts.

Metal posts will last longer than wood posts because they will not rot, but they are not as strong as wood posts. By alternating posts, costs are reduced with a minimal reduction in the strength of the fence.

Barbed wire is selected by evaluating the cost and needs of the operation. Heavier gauges are more expensive, and wire with 4-point barbs is usually more costly than wire with 2 points. Post spacing, the number of strands used, the size of the area to be fenced, and the type of livestock to be contained are all factors to consider when choosing wire. For example, a small lot for cattle would benefit from five strands

of 12-gauge wire with 4-point barbs. A sturdy fence would be necessary in an area where cattle would be pushing against the fence often. This type of fence may also require closer post spacings, and the use of more wooden posts rather than metal t-posts. A fence for cattle on a range area works well with four strands of 2-point 14-gauge wire. Posts may be spaced more widely for this type of fence, and metal t-posts would work well for this situation.

Relatively few tools are necessary to build the fence. A claw hammer, fencing pliers, and fence stretcher are sufficient.

#### **Laying Out Barbed Wire**

Barbed wire fence installation is not complicated, but it can be dangerous because of the sharp barbs. When working with barbed wire, observing all safety practices is a must.

Once the posts are in place, the bottom strand of the wire is wrapped around the corner post two or three times and stapled securely. The end of the wire should be twisted tightly around the wire strand. This connection to the post must be very secure for the wire to be stretched without coming loose. The number of strands of wire used determines the height of the bottom strand.

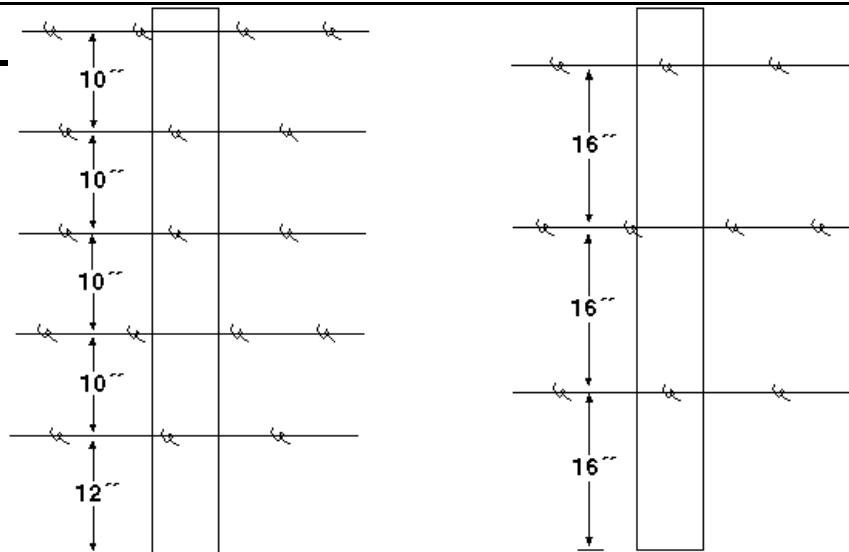
Figure 3.1 shows an example of some typical spacings.

Having attached the first strand at the desired height, the wire may be unrolled along the fence line on the stock side of the posts. The length of wire unrolled depends on the topography, fence layout, and the position of fence brace structures. Barbed wire comes in rolls of wire a quarter mile long, and the entire length of the wire can be laid out at once under the proper conditions. Using short stretches of wire is more costly, because more time and more materials, most notably for brace assemblies, are required. More braces are necessary because the fence should be braced at each end of a stretch of wire. The same procedure is used for each strand, from the bottom to the top.

The wire should be placed as close as possible to the fence line. Walking the fence line and moving the wire into place may be necessary. This practice helps to remove excess slack prior to stretching the wire.

#### **Stretching Barbed Wire**

## Fencing



The next step in putting up the fence is stretching the wire. Most fence stretchers are simple and effective. Many designs are available, including systems that operate on winches, pulleys, or ratchet systems. One common tool has a clamp on one end to grasp the wire while the handle operates as a lever against a post to stretch the wire. Tractor-operated or hydraulic stretchers are available for larger fence construction projects.

To operate a stretcher, it must be attached to the wire being stretched. The stretcher can be attached to a solid object in line with the wire, usually the post of a brace structure, or a piece of equipment. Short stretches should not be made to line posts because these posts are not secure and will pull over easily. For longer stretches, the wire can be stretched and spliced in the middle to distribute the pull more evenly throughout the wire. The stretcher then connects to the wire only. Slack is taken up with the stretcher, and then the wire is spliced once it is at the proper tension.

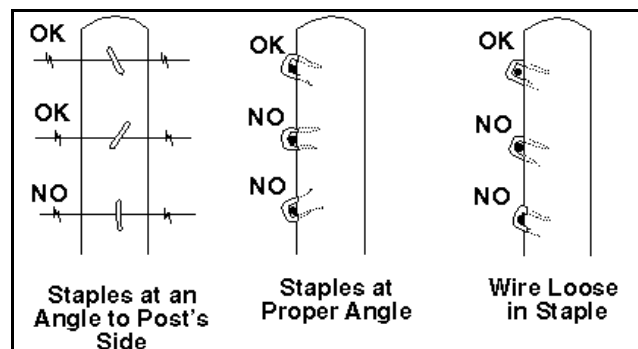
The length of wire to be stretched at a time depends on the topography of the area and the stretching tools. Hilly areas require stretching Staples are used to attach wire to wood posts. Although most fencing pliers have a hammering surface, a hammer is useful if much stapling is required. When attaching the wire, the staples are angled as shown in Figure 3.2, with the staples set diagonally at a slight downward angle to resist the pull of the wire. The staple is then driven into the post. Staples should not be driven in so tightly that they and the wire become embedded in the post. The wire needs room as

short sections at a time to keep the wire level. A rule of thumb is to stretch from 5 to 20 rods at a time; a rod is 16½ feet. Stretching longer sections of wire will take less time.

Using the stretcher to take up the slack, the wire is slowly stretched to the point of being relatively tight and straight. The wire should not be too tight to allow expansion and contraction of the metal wire due to temperature changes. Wire should never be stretched too tightly, because overstretching may break the wire. Depending on the length of the stretch, it may be necessary to walk along the fence line and untangle the wire.

### Attaching Barbed Wire

Once the fence is tight, the wire is attached to the post while the stretchers are still in place. The end of the wire should be long enough to wrap completely around the post twice and then be tied off back onto the wire itself. The wire generally is then stapled to the post to prevent slippage if the tie works loose.



## ***Lesson 3: Barbed and Woven Wire Fences***

---

it expands and contracts with changes in temperature.

If steel posts are used, the wire is attached using metal clips supplied with the posts. These clips are used to hold the wire against the post. Fencing pliers are most commonly used to position the clips, but some types of posts require a specific tool supplied by the post retailer to attach them.

### **Woven Wire Materials and Tools**

To erect a woven wire fence, the appropriate type of wire and fasteners are necessary. Woven wire is a type of fencing material in which wires are connected together to form a mesh. The horizontal wires are continuous throughout the fence. The vertical wires, or stays, are attached in one of two ways. One method has short pieces of wire wrapped into a knot at each horizontal wire, so the stay is not one piece of wire. This variety is referred to as hinge lock wire because the knot resembles a hinge. Another method has a continuous stay with short sections of wire forming the knots that attach the stay to the horizontal wire. This type of woven wire is referred to as stiff stay wire.

Woven wire comes in either soft or high tensile wire. The traditional soft wire fencing typically has wire of a heavier gauge for the top and bottom wires, while high tensile wire uses wires that are all the same gauge.

An industry standard system of labeling indicates the size of the woven wire fencing. A three-number designation identifies the number of horizontal wires, the height of the fence, and the distance between vertical stay wires. For example, a designation of 10-47-6 would identify wire that has 10 horizontal wires, is 47 inches tall, and has stays spaced 6 inches apart.

When selecting woven wire, the chief factors to consider are the gauge, protective coatings, and the application, which may affect the pattern, weave size, or height of the wire chosen. Like barbed wire, woven wire is sold by gauge. The lower the number assigned, the larger the diameter of the wire is. Zinc, aluminum, and sometimes vinyl coatings extend the life span of The wire is rolled out either to the brace structure that it is to be attached to or to the point where it will be spliced onto another roll. Rolls of woven

woven wire. Many patterns and weave sizes are available, and the fencing comes in a variety of heights, commonly 20 to 60 inches. When selecting woven wire, the application is critical. For example, chickens would need a higher, lighter weight fence with smaller openings than fencing for hogs.

Woven wire may be used with either wood or metal posts. Wood posts require staples for fastening the wire, while metal posts call for wire clips.

The tools needed to put up the fence are much the same as for barbed wire. They include a claw hammer, fencing pliers, and a woven wire stretcher. A woven wire stretcher works the same way as any other wire stretcher. However, because woven wire comes in dimensional form, stretching the top, bottom, and middle of the wire at the same time is important. A shovel may also be needed to trench elevated areas in the fence line that will interfere with the bottom wires.

### **Laying Out a Woven Wire Fence**

When laying out the wire, the first step is unrolling the wire past the corner post on the side of the post to which the wire will be attached.

Enough wire should be laid out to wrap around the post once. Three or four stays should be removed to wrap around the post cleanly.

Stays are removed in one of two ways, depending on the type of woven wire. For hinge lock fencing, the stay is cut in the middle of each block. Then, while using pliers to hold the knot, the ends of the cut wire are grabbed and twisted in the opposite direction from the knot. The sections of the stay wire should slide off the horizontal wire. For stiff stay wire, the small knot wire that holds the vertical stay in place is cut.

After removing the stays, the wire is set to the desired height against the anchor post. The wires are then wrapped around the post and tied off by splicing the end of each wire onto itself. This practice will make a solid connection for stretching.

wire are 330 feet long. The maximum length that can be stretched at one time is a quarter mile, which will consist of four rolls of wire. For

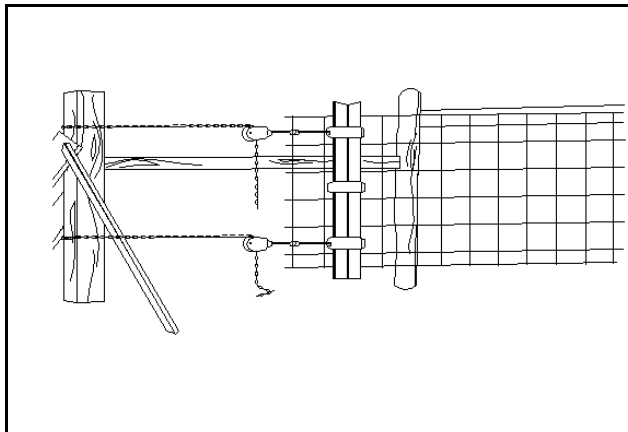
## Fencing

short stretches of wire, the wire will be rolled out past the brace structure to be stretched. If two or more rolls are required, one roll is fastened to a post at each end, and then the wire rolls are stretched and spliced in the middle. An alternative method is to attach one end of the first roll to a post and then tie the other end to the next roll. The entire length is tightened at the same time. However, the wire will not be as tight as it would be if it were stretched in the middle.

### Stretching Woven Wire

Wire stretching can be done in several different ways, although most stretchers operate on either a pulley system or a leverage system. Woven wire can be stretched using stretcher boards; one type of stretcher board is shown in Figure 3.3. Stretcher boards can be made of either wood or metal. Wood stretcher boards are made of 2" x 4" boards that are bolted together to hold the woven wire. Prior to stretching the wire, the position of the holes for the bolts are laid out and marked on the boards; they should be positioned to fall between the horizontal wires.

The boards are clamped together, and the top of the boards is marked. The holes are then drilled through the boards. The holes are generally 5/16 to  $\frac{1}{2}$  of an inch in diameter, depending on bolt size. Typically, four evenly spaced holes are needed for woven wire that is up to 5 feet tall, with more holes needed for taller fences. Metal stretcher boards can also be purchased from retailers that carry fencing supplies. On these stretcher boards, bolts for tightening the stretcher boards have been welded into position. Typically, metal stretcher boards are purchased if a large amount of fencing will be done.



To stretch short stretches of wire from one brace structure to another, the stretcher boards are attached to the wire a few feet past the post to which the wire will be tied off. The boards should be attached in line with one vertical stay. If the boards are attached at an angle, the fence will not stretch evenly. The ends of a heavy chain are wrapped around the top and bottom of the boards. A cable winch-puller, or come-along, is attached to the chain and to a secure point, such as a truck, tractor, or another fence anchor post. If two come-alongs are available, two chains can be used with the stretcher boards instead of one.

The fence should be tensioned slowly. When the fence is properly tensioned,  $\frac{1}{2}$  to  $\frac{3}{4}$  of the tension bump should be removed. A tension bump is a small bend in the woven wire that acts as an aid in determining if the wire has been tightened enough. If the tension bump is completely straightened, the wire is too tight. While the fence is being stretched, it may need to be shaken to free it from snags.

### Attaching Woven Wire

When the wire has been stretched, each wire is tied off, one at a time. The wire is cut at a point far enough past the post for the wire to wrap around it. Any stays that might interfere with the post should be removed. The wire can then be wrapped around the post, tied off, and stapled tightly to the post. Finally, the stretcher boards are removed.

The horizontal wires are then attached to the line posts. With wood posts, each wire is stapled tightly, so that the staple and wire are set into the post. Staples are placed crosswise with a slight downward angle, as shown in Figure 3.2. If metal posts are used, wire clips supplied by the retailer of the posts are fastened according to the manufacturer's recommendations.

Generally, for fences up to 4 feet tall, only five staples or clips are needed per post. Taller fences may require a few more fasteners. The top and bottom wires are attached at every post, while the other fasteners should be staggered on different wires at each post.

### Summary

### *Lesson 3: Barbed and Woven Wire Fences*

---

Barbed wire and woven wire fences are common types of fences in agriculture. The basic materials and tools needed to build these types of fences are similar: barbed or woven wire, fasteners, a claw hammer, fencing pliers, and a fence stretcher. In each case, the wire is laid out along the fence line and attached to the brace structure, stretched properly, and then attached to other brace structures and the line posts.

#### **Credits**

Ramsey, Dan. *The Complete Book of Fences*. Blue Ridge Summit, Pa.: TAB Books, Inc., 1983.

*Selecting Wire Fencing Materials (G1191)*. University Extension agricultural publications, 1993.

