

Fencing FACTSHEET



Order No. 307.252-1
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ELK EXCLUSION USING WOVEN WIRE FENCING

This factsheet outlines the use of woven wire to exclude elk in high pressure areas such as feed storage yards. Two designs are outlined, one for low elk pressure situations and the other for high pressure situations. Refer to Factsheet No. 307.252-2 for information on electric fencing to exclude elk.

INTRODUCTION

Elk damage to crop land and feed storage yards is a very serious problem in BC, especially in areas such as the Peace River, East Kootenays and recently the McBride valley. Two basic fence types can be used.

ELECTRIC FENCE

This is a psychological barrier which is low cost but may not be 100% effective in high elk pressure areas such as feed storage yards.

Electric fences have proven successful around large areas such as crop fields. There are definite cost advantages when fencing these large areas that usually have low to medium elk pressure. Refer to Factsheet 307.252-2 entitled *Elk Exclusion Using Electric Fencing*.

WOVEN WIRE FENCE

This is a physical barrier that can be very effective but is more expensive than an electric fence. It is best suited to high-pressure areas such as feed storage yards. Two designs are outlined below.

DESIGN A (minimum)	8 feet woven wire
Total Height:	8 feet
Woven wire:	20/96/12 knotted joint *20 horizontal wires *96 inch height *12 inch spaced vertical wires
Line Posts:	3 to 4 inch by 12 feet
Braces Posts:	4 to 5 inch by 12 feet

ALTERNATIVE DESIGNS

Alternatives to a one piece woven wire design are:

- 4 or 5 ft woven wire with strands of wire above
- 2 pieces of 4 ft woven wire one over the other

While these options can reduce costs, they should be selected to match the amount of elk pressure.

FENCE POST HEIGHT EXTENSIONS

Height extensions to posts (on existing posts or to reduce the cost of new posts) may be successful if:

- extensions are adequately sized
- connection to the existing post is adequate
- existing posts have been set deep enough; (up to 1/3 of new fence height in ground); depth on existing posts may be insufficient

DESIGN B (high pressure)	8 feet woven wire with larger posts; (plus optional 2 to 3 single strands of high tensile smooth wire above woven wire)
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Total Height:	9 1/2 to 10 feet
Woven wire:	20/96/12, knotted joint *20 horizontal wires *96 inch height *12 inch spaced vertical wires
Line Posts:	4 to 5 inch by 12 feet
Brace Posts:	5 to 6 inch by 12 feet
Optional Top	Wires: 2 single strands spaced 9/9 inches or, 3 single strands spaced 8/8/8 inches
(note, these top wires may require either 14 foot posts or extensions onto 12 foot posts)	

WOVEN WIRE DESIGN

All wires are 12 1/2 ga. galvanized steel (some variation is possible); some woven wire uses high tensile steel for greater strength. Additions can be made to these two designs for added control:

To resist elk jumping over the wire

- extra strands above the woven wire
- **DO NOT** use material such as boards as a horizontal top rail; this will give elk a well defined reference point and increase their tendency to jump

To resist high elk pressure on the wire

- use knotted joint woven wire as **Design A** and **B**
- wire with 6 inch spaced verticals is available but is more expensive and not likely needed

Figure 1 shows a woven wire elk fence with one extra top wire.



Figure 1 Typical Elk Exclusion Fence Using Woven Wire

WOVEN WIRE JOINTS

Two types of joints are available where line (horizontal) and stay wires (vertical) cross: **hinged** and **knotted**.

A **hinged joint**, Figure 2 below, is made with separate short lengths of stay wire and allows the fence to “fold” under pressure. However, the wire wrap can come loose allowing the stay wire to separate from the line wire.

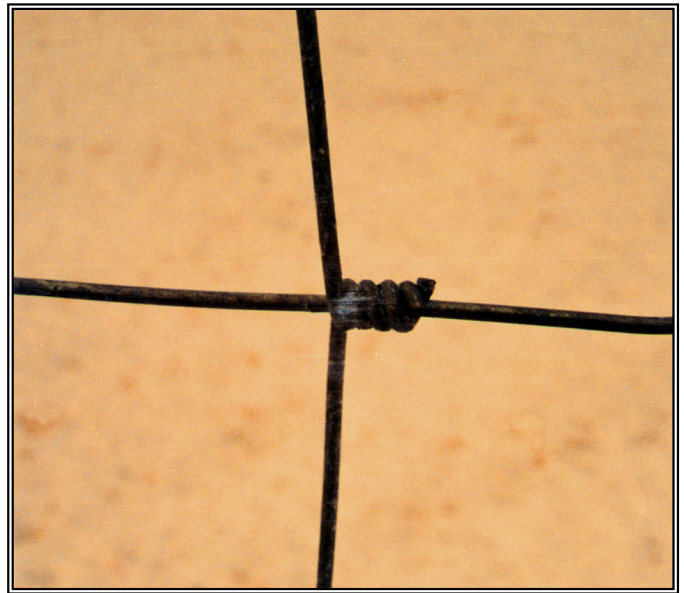


Figure 2 Hinged Joint Woven Wire

A **knotted joint**, Figure 3 below, is made with a one piece continuous stay wire and separate knotting wire. This joint will not separate easily and is the preferred choice because of the extra security of the joints.

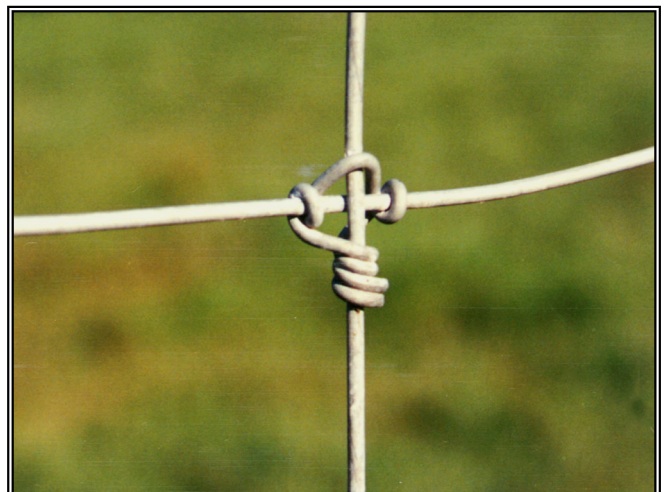


Figure 3 Knotted Joint Woven Wire

INSTALLING WOVEN WIRE

The following points are important when installing woven wire fences:

- Place the wire on the elk side of the line posts. Ensure the wire is flush with the ground and there are no gaps due to terrain irregularities.
- Join woven wire by using a wrap-splice, Figure 4 below. Leave 4 to 6 inches of line wire beyond the end stay. Lay together the end stay wires of each of the two sections to be spliced, then wrap the free ends tightly around the line wire with pliers or splicing tool.



Figure 4 Splicing Woven Wire

- An alternative splice is a compression sleeve. See Factsheet 307.131-1 entitled *Splices for High Tensile Smooth Fencing Wire*.
- Tension woven wire to remove only 1/3 to 1/2 of the tension curve from the line wires, as shown in Figure 5 below.

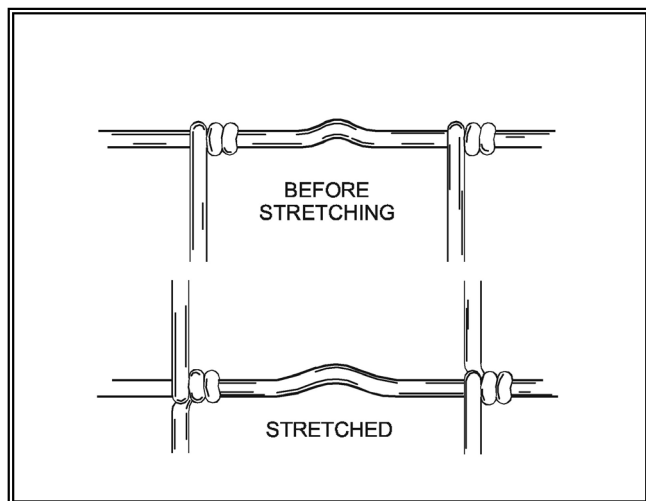


Figure 5 Tensioning Woven wire

- Tensioning may be done from the end post (then stapling wire tight onto brace post) or from a braced dummy post set 6 to 8 feet beyond the brace. Extreme caution is necessary if using a tractor for tensioning because of the operator hazard as well as possible over-tensioning.
- When tying off woven wire at the end brace, take the free end of each line wire around the end post and wrap on itself, as shown in Figure 6 below. **DO NOT** depend only on staples to hold the fence wire tension.

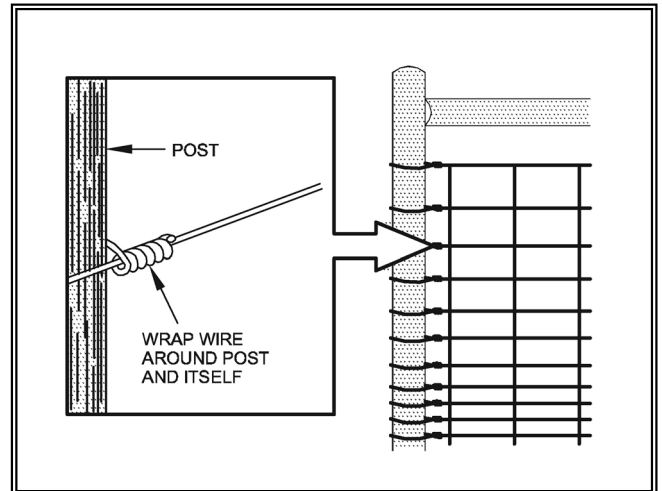


Figure 6 Tying Off Woven Wire

- **DO NOT** drive the staples “home” on line posts. The wire should be free to move.
- For maximum pull-out resistance, rotate staples so as to cross the grain of the post (reducing post splitting) and to ensure the two legs of the staple spread out and away from each other.
- Individual htsw strands are tensioned to 200 lbs. and knotted or spliced as shown in Factsheet 307.131-1 entitled *Splices for High Tensile Smooth Fencing Wire*.

FENCE LINE POSTS

The following is recommended:

Design A Line Post- 3 to 4 inch by 12 feet long

Design B Line Post- 4 to 5 inch by 12 feet long

- "3 to 4 inch" means the post diameter range
- use pressure treated posts
- set posts a minimum of 3 feet into the ground
- space according to the terrain: up to 15 feet apart average; up to 20 feet apart in level terrain
- extensions may be required on **Design B** posts

FENCE BRACE ASSEMBLIES

Braces are the foundation and anchor of a good fence. Using good construction practices will protect the orchard or vineyard and ensure a long fence life.

Note good brace construction in Figure 7 below:

- posts are set in ground 3 1/2 to 4 feet
- the horizontal rail is not notched into the driven posts, but is connected using 3/8 inch rebar into pre-drilled holes
- the height of the rail is approximately 3/4 of the fence height
- braces are set at a maximum of 660 feet apart
- use inline braces if no corners are needed

End Braces: 2 posts at 4 to 5 inch minimum dia. (preferred 5 to 6 inch) by 12 feet long (optional to

use a 10 foot brace post and a 12 foot tie post to reduce costs) set a minimum 3 1/2 to 4 feet in the ground; 1 rail at 4 to 5 inch by 10 feet long.

This single span brace is sufficient for most conditions. In poor soils (sandy, wet, etc.), use a double-span brace assembly with three driven posts and two rails with the wire tie-off on the centre post.

Inline Braces: Use an end brace (for runs greater than 660 feet) with brace wires in both directions.

Corner Braces: For 90° corners, use a brace of three driven posts and two rails. (Optional if the wires are being tied off – build two separate end braces of 4 driven posts and 2 rails).

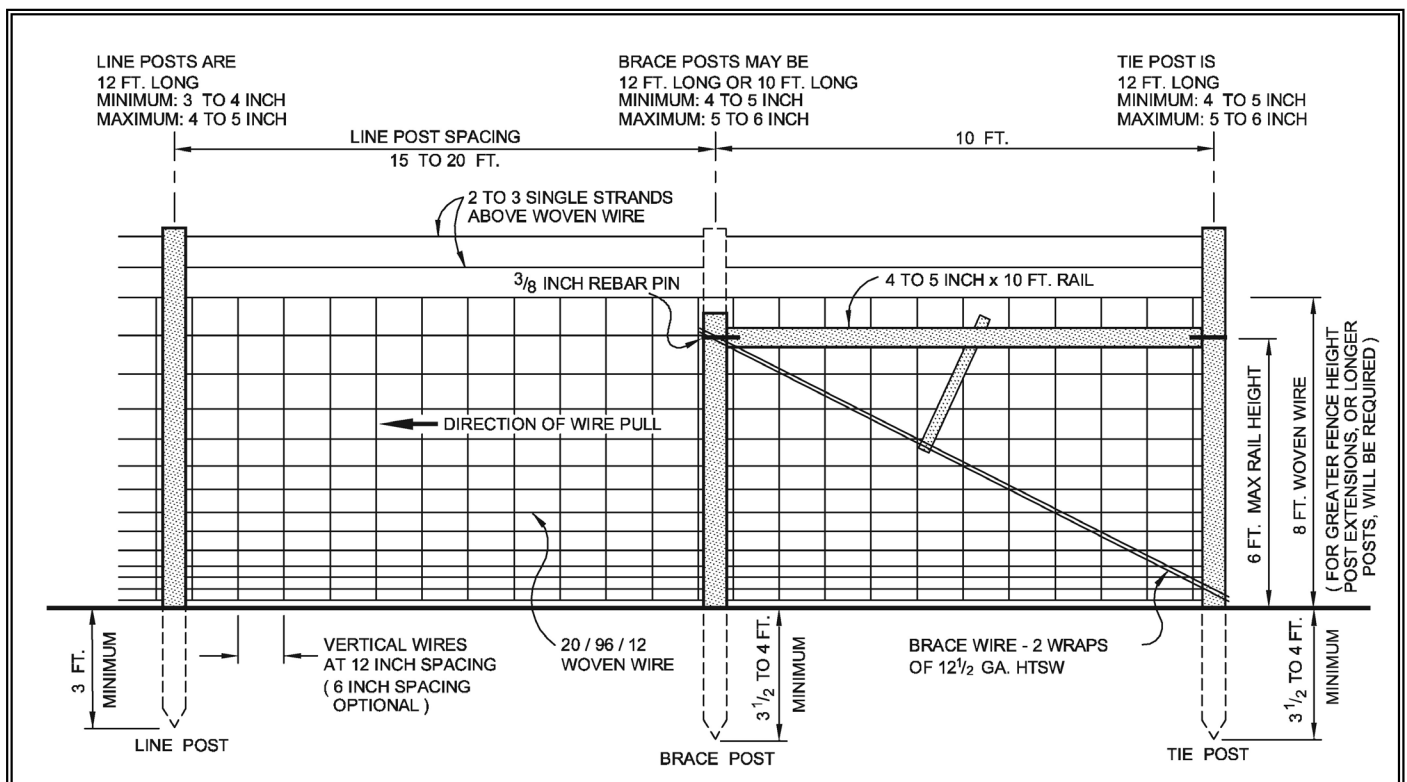


Figure 7 Typical Line Fence and End Brace Design for Woven wire Elk Fence

FENCE EFFECTIVENESS

Fencing out elk driven by hunger is quite different from fencing commercial livestock. The other options the elk may have for food, such as unfenced neighbouring fields, will affect how they will pressure a fence. At some hunger threshold, elk may breach almost any fence design.

FOR FURTHER INFORMATION CONTACT

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