

Fencing FACTSHEET



BRITISH
COLUMBIA

Ministry of Agriculture, Food and Fisheries

Order No. 307.271-1
Agdex: 724
Revised July 2002

DEER FARM PERIMETER FENCE

This factsheet outlines construction information for woven wire perimeter fences for fallow deer and reindeer farms. The fence design is the standard required for a Game Farm License in B.C. Cost estimates are given for materials and labour.

INTRODUCTION

Woven wire and high-tensile, smooth wire (htsw) are the preferred products for fencing deer. Barbed wire is not used except for special predator problem areas. Provincial permit regulations require woven wire for perimeter fences, while internal fences are not regulated. Electric fencing has an important role in both types of fences. In deer handling areas and milling yards, wood batten fencing should be used to restrict visibility, thereby improving handling.

EXTENDING EXISTING FENCES

There are three concerns in converting existing fences for use as a deer farm perimeter fence:

- Will the extensions have adequate strength?
- Can the connection to the post be made adequately?
- Are the existing posts set in the ground adequately?

The first two points can be met, but post depth is usually not sufficient in existing fences. For a seven-foot fence, line posts must be in the ground two and one-half to three feet.

PERIMETER FENCE DESIGN

Provincial regulations require a seven-foot high fence all of which must be woven wire. Shown below is a design using woven wire with graduated openings.

Note: Knotted-joint style woven wire is required on perimeter fences with 6-inch vertical wire spacing. The bottom three feet must have wire openings small enough to contain fawns.

Additions can be made to these two designs for added control:

- Additional top wires for added height or tighter spacings. One or more strands of htsw may be used above the woven wire in areas of high deer pressure (e.g., where the perimeter fence also serves as one side of a mustering area or alley).
- Electrified offset wire(s) either inside at 24 to 30 inches high, or outside at predator height

WOVEN WIRE PERIMETER FENCE FOR FALLOW DEER AND REINDEER FARMS

Total Height	- 84 inch (min.) knotted joint style
Horizontal wires	- 18 wires, 12 ½ ga., high tensile, graduated openings tighter at the bottom half of fabric
wire spacing	- graduated from 3 inch (bottom) to 7 inch (top).
Vertical wires	- 12 ½ ga., medium tensile
wire spacing	- 6 inch (fallow) 12 inch (reindeer)

- Electrified htsw top wire(s) for extra predator control.
- Electrified offset wire(s) either inside at 24 to 30 inches high, or outside at predator height.
- One outside barbed wire at ground level to resist any digging predators.
- An extra piece of woven wire (one or two feet) buried and attached to the bottom of the fence wire to resist any digging predators. This will be awkward to do and wire corrosion may limit the life expectancy. Pressure-treated wood boards are an alternative.
- Wood battens or other materials attached to the woven wire to increase fence visibility in areas of concern, often to aid deer mustering.

These additions can be used depending on the individual farm needs. See Figure 1 for a woven wire fence with one electric offset wire and one extra top wire.

TYPES OF WOVEN WIRE

Various types of joints are used where horizontal and vertical wires cross. Only hinged joint and knotted joint are suitable for fencing; **only knotted joint** for perimeter fencing fallow deer and reindeer farms.

A **hinged joint** (Figure 2) is made with separate short lengths of stay wire twisted together at the horizontal wire. This is a flexible wire fabric; however, the wire wrap can come loose under pressure allowing the stay wire to slip sideways.

A **knotted joint** (Figure 3) is made with a one-piece, continuous stay wire and a separate knotting wire. This joint is strong and secure.

Knotted-joint woven wire is the only choice for perimeter fences because of the extra security of the joints. Both types may be used for interior fences.

INSTALLING WOVEN WIRE

The following points are important when installing woven wire fences:

- Place the wire on the animal side of the line posts (but on the outside of posts when turning corners). Ensure the wire is flush with the ground and there are no gaps due to terrain irregularities. Deer will



Figure 1 Deer Exclusion Fence

go under a fence if it is possible. A well-prepared right-of-way is important

- Mechanical splices for woven wire are made the same as individual wires. This is the preferred method of joining woven wire.
- Woven wire can also be joined with wrap splices by leaving four to six 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 and wrap the ends back onto themselves as in Figure 4.



Figure 2 Hinged Joint

- Tension woven wire to remove only one-third to one-half of the tension curve from the line wires. See Figure 5.
 - Tensioning may be done from the end post (then stapling wire tight onto the brace post), or from a braced dummy post set six to eight feet beyond the brace. Never use a tractor for tensioning because of the operator hazards and 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 it on itself. See Figure 6. Do not depend on staples to hold the fence wire tension.
 - Do not "drive" the staples "home" on line posts. The wire should be free to move.
 - For maximum pullout resistance, staples should be rotated 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 pounds.

PERIMETER FENCE LINE POSTS

Whichever wire configuration is used, the following is recommended for posts (all posts must be pressure-treated for long life):

- Line Posts: *4"/5" by 10' long set 2 ½' into the ground and spaced up to 15' apart (up to 20' apart in firm, level terrain).

* 4"/5" indicates a 4-inch to 5-inch diameter post.

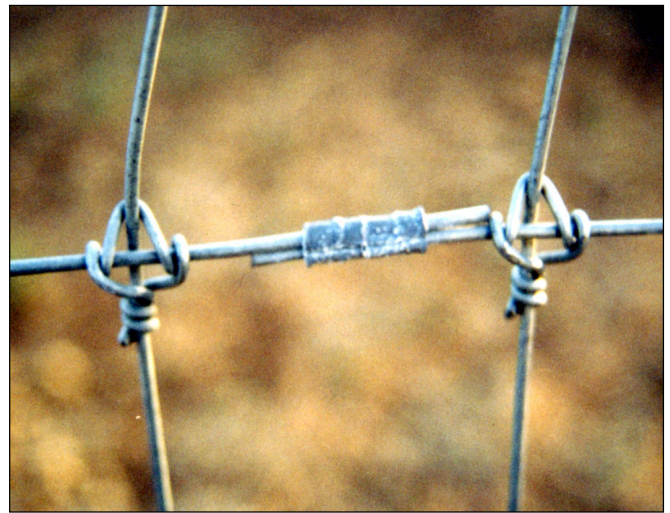


Figure 4 Splicing Woven Wire

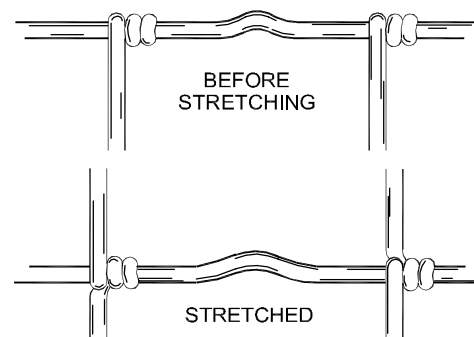


Figure 5 Tensioning Woven Wire

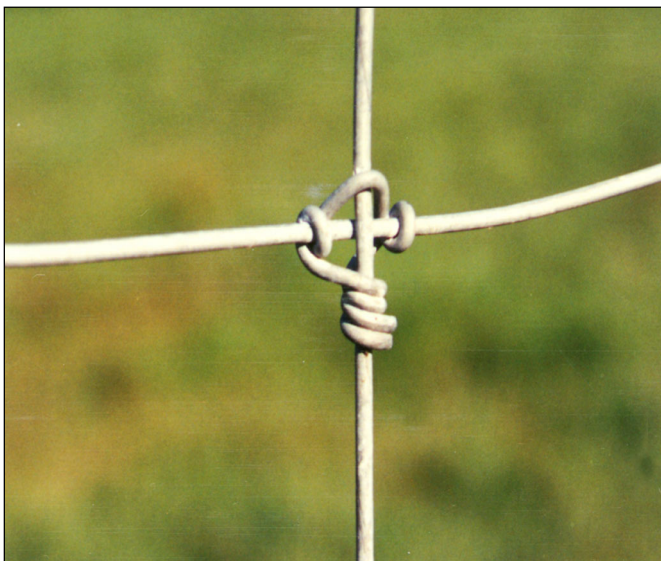


Figure 3 Knotted Joint



Figure 6 Tying Off Woven Wire (top view)

PERIMETER FENCE BRACE ASSEMBLIES

Figure 7 illustrates good end brace construction. Note the horizontal rail is not notched into the driven posts but is connected using 1/2" rebar into pre-drilled holes.

End Braces: Two posts @ 5"/6" by 11' long set 4' into the ground. One horizontal rail @ 4"/5" by 10' long. This single-span brace is sufficient for most conditions but in poor areas (sandy soil, wet areas, etc.), use a double-span brace assembly. This has three driven posts and two rails with the wire tie-off on the centre post.

Corner Braces: For 90° corners, use a brace of three driven posts and two rails. Tie off both woven wires at the corner post or continue the wire around the outside of the brace.

Note: Braces can be set up to 660 feet apart.

ELECTRIC FENCE WIRES

Electric fences are very effective for internal fences. On perimeter fences, electric wires can be used for added control (see *Perimeter Fence Design*, page 1). Animals require training at first, but quickly learn to respect the electric "bite." Because you are constructing an electric circuit, pay close attention to insulation, all wire connections, and especially wire grounding. Problems in electric fences are often due to poor grounding.

Note: For safety reasons, do not electrify barbed wire.

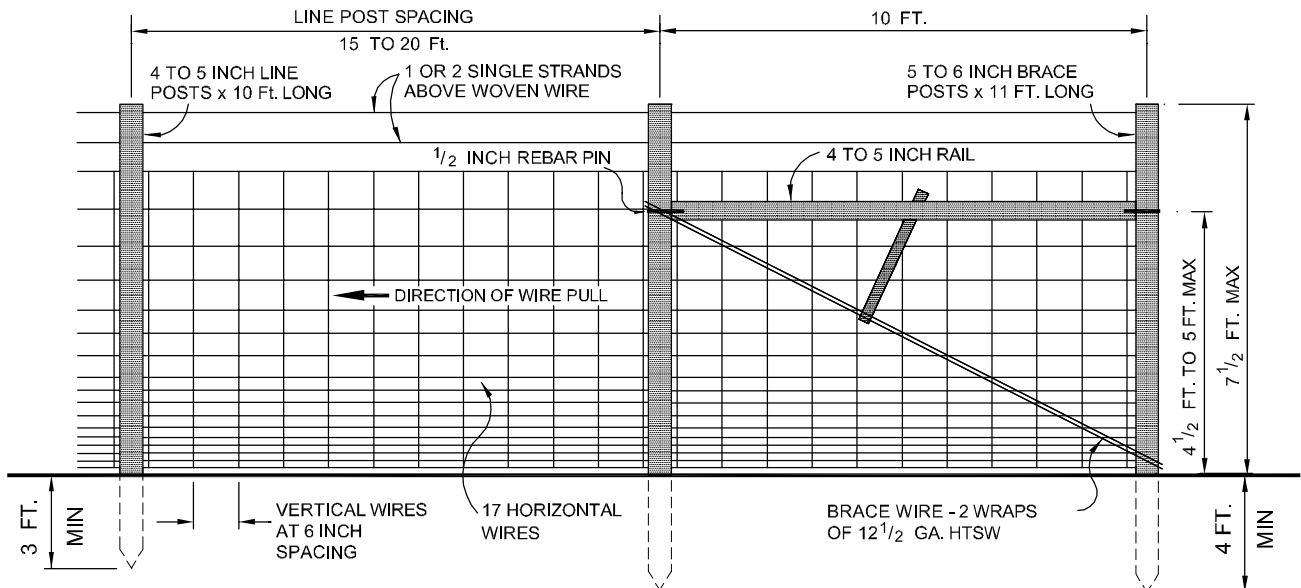


Figure 7 Perimeter Fence and End Brace Design

DEER FARM PERIMETER FENCE INSTALLED COSTS

The following three pages outlines the material and estimated labour costs to install a perimeter fence for deer farms. Prices are dated 1995 and are F.O.B Kamloops. Freight and taxes are extra. Labour costs vary widely as noted in Table 2. Detailed estimates are given in Tables 1, 2 and 3, while a quick estimate method is shown in Table 4.

Table 1 DEER FARM PERIMETER FENCE - MATERIAL COSTS

<p>A. WIRE Woven wire alone or with single strands of smooth or barbed wire above to a height of 7 ft. A 6 inch spacing on the vertical wires with the knotted joint woven wire design is used.</p> <p>all woven wire perimeter fence design for deer farms</p> <p>18/84/6 woven wire \$ 1.17/ft</p> <ul style="list-style-type: none"> • 18 line wires • 84 inch height (7'0") • 6 inch spaced verticals • knotted joint construction • 330 ft. rolls • <p>plus single strands above the woven wire (optional if height above 7'0" is required)</p> <ul style="list-style-type: none"> • 1 strand @ 9 inches (\$ 0.03/ft per strand) 0.03 (min) or two strands 0.06 (max) 					<p>COSTS</p> <p>\$ 1.17/ft</p>	
<p>B. LINE POSTS 4 – 5 inch top x 10 ft (by the bundle)</p>					<p>\$ 5.00 ea</p>	
<p>C. STAPLES 2 inch long, slash point, galvanized</p>					<p>\$ 0.015 ea</p>	
<p>D. FENCE MATERIAL COST PER FOOT (calculated for 15 ft and 20 ft post spacings)</p>				<p>COST / 15 FT</p>	<p>COST / FT (posts @ 15 ft) (av. conditions)</p>	<p>COST / FT (posts @ 20 ft) (good conditions)</p>
	<p>15 ft of wire</p>	<p>1 post</p>	<p>12 staples</p>			
<p>18/84/6</p>	<p>\$ 17.55</p>	<p>\$ 5.00</p>	<p>\$ 0.18</p>	<p>\$22.73</p>	<p>\$ 1.52</p>	<p>\$ 1.43</p>
<p>E. END BRACE MATERIAL COST A standard end brace consists of two vertical posts (set a min of 3 ft into the ground) and one horizontal rail (set up from the ground 2/3 to 3/4 of the fence height). The rail is pinned to the two posts and a wire is tightened diagonally.</p> <ul style="list-style-type: none"> • 2 posts @ 5 to 6 in x 12 ft @ \$ 9.25 ea \$ 18.50 • 1 rail @ 4 to 5 inch x 10 ft @ 5.00 ea 5.00 • 2 – 3/8 rebar pins @ 0.16 ea 0.32 • 50 ft of 12.5 ga. htw @ 0.022/ft 1.10 • 4 ft of 2 x 2 (twist stick) @ 0.14/f t 0.56 • 5 + 24 staples @ 0.015 ea 0.44 					<p>\$ 25.92 ea</p>	
<p>F. CORNER BRACE MATERIAL COST A standard corner brace consists of two end braces that share a corner post (ie: there are three driven posts and two horizontal rails). As the materials for a corner brace include that of two end braces less one post, the material costs are:</p> <ul style="list-style-type: none"> • 2 end braces \$ 25.92 (minus on post @ \$ 9.25) 					<p>\$ 42.59 ea</p>	
<p>G. GATES – Gates will vary from home built wooden to purchased metal frames, covered with woven wire.</p>					<p>\$200.00 ea</p>	

Table 2 DEER FARM PERIMETER FENCE - LABOUR COSTS

(labour cost may vary widely depending on the terrain, soil conditions, the amount of fence being constructed, access, etc. The following estimates are for average conditions)

H. LABOUR FOR LINE FENCE CONSTRUCTION	estimate \$ 0.75 per ft.
I. LABOUR FOR BRACE CONSTRUCTION	
<ul style="list-style-type: none"> • End brace estimate • Corner brace estimate 	estimate \$ 20.00 ea estimate \$ 40.00 ea

Table 3 DEER FARM PERIMETER FENCE - TOTAL INSTALLED COSTS

J. INSTALLED LINE FENCE		estimated installed fence costs
<ul style="list-style-type: none"> • Materials \$ 1.43 to 1.52/ft • Labour (estimated) 0.75/ft 		\$2.18 to 2.27 per ft
K. INSTALLED BRACES		estimated installed end brace costs
<ul style="list-style-type: none"> • End brace materials @ \$ 25.92 ea • End brace labour (estimated) @ 20.00 ea • Corner brace materials @ 42.59 ea • Corner brace labour (estimated) @ 40.00 ea 		\$ 45.92 ea estimated installed corner brace costs \$ 82.59 ea

Table 4 DEER FARM PERIMETER FENCE - QUICK COST ESTIMATES

L. The following information is presented for quick estimates of fences prior to a detailed fence plan being available. The material costs from Table 1 are general rules regarding proportional labour costs. The cost of braces and gates are estimated as a percentage of line fence costs. **PLEASE, FOR INITIAL ESTIMATES ONLY !**

MATERIALS:

- | | |
|---|----------------|
| • Line fence up to \$ 1.52/ft | \$ 1.52/ft |
| • Braces up to 15 % of line fence costs | 0.23/ft |
| • Gates up to 5% of line fence costs | <u>0.08/ft</u> |
| | \$ 1.83/ft |

LABOUR:

- | | |
|--|-----------|
| • Estimate @ 40% labour, 60% materials | \$1.20/ft |
|--|-----------|

CONTINGENCY:

- | | |
|---|------------|
| • Estimate @ 7% of labour and materials | \$ 0.22/ft |
|---|------------|

estimated installed perimeter fence costs
\$ 3.25 per linear foot

Example: PERIMETER COSTS FOR A 100-DOE DEER FARM

The Ministry of Agriculture, Food and Fisheries' "Planning for Profit" enterprise budgets for fallow deer use a "typical" deer farm of 35 acres for 100 does. The following is the calculation for perimeter fence costs used in that example.

◆ Line fence (1500 + 1200 + 976 + 524 + 676 + 5400 ft. of perimeter fence)	5400 ft x \$2.18/ft = \$11,772 to 5400 ft x \$2.27/ft = \$12,258 (installed)
◆ Corner braces	5 corners x \$83 ea = 415
◆ Line/end braces	6 braces x \$46 ea = 276
◆ Gate	1 x \$200 = 200

Cost to perimeter fence the 35 acre example farm:

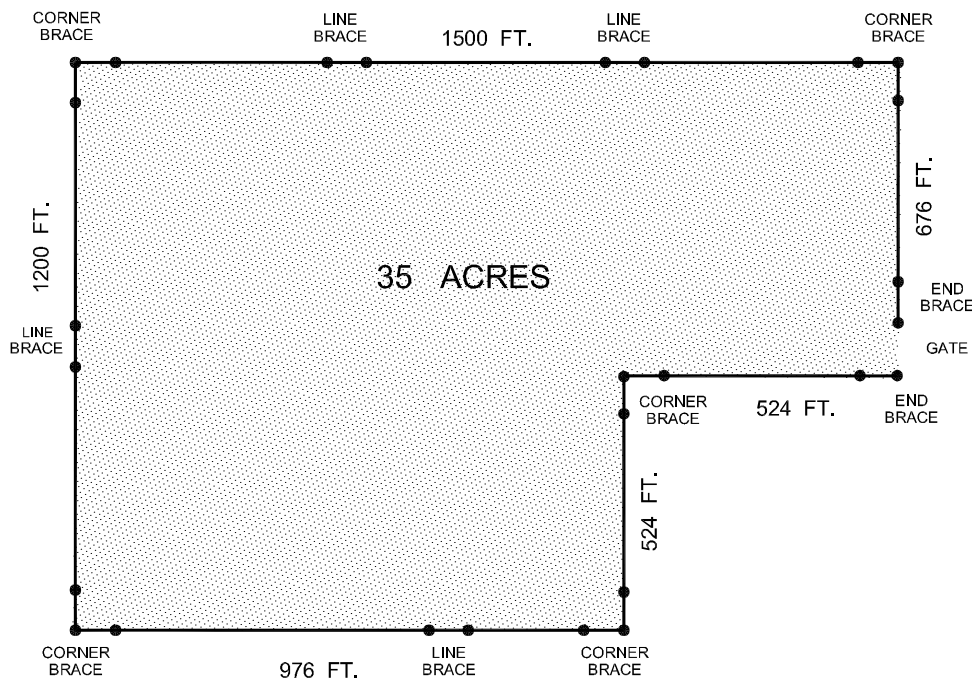
\$11,772 + \$415 + \$276 + \$200

\$12,258 + \$415 + \$276 + \$200

= \$12,663 to

= \$13,149

(= \$362 to \$376/acre)



For further information on related topics, please visit our website
Resource Management Branch

www.agf.gov.bc.ca/resmgmt

Linking to our

Publications and Conceptual Plans

FOR FURTHER INFORMATION CONTACT

Lance Brown, Engineering Technologist

Phone: (250) 371-6064

Email: Lance.Brown@gems6.gov.bc.ca

RESOURCE MANAGEMENT BRANCH

Ministry of Agriculture and Food

162 Oriole Road

Kamloops, BC CANADA V2C 4N7