

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 deer crawling under the wire

- use an extra bottom strand of either htsw or barbed wire clipped to the bottom woven wire
- use a piece of woven wire (1 to 2 ft.) buried and clipped to the bottom woven wire. This may be awkward to do and wire corrosion may limit the life expectancy
- use boards (preferably pressure treated) buried and stapled to the bottom woven wire

To resist deer crawling through the wire

- extra wire strands at deer height; consider the effect of snow pack in “reducing” fence height
- one or more electric wires offset to the deer side

To resist deer 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 deer a well defined reference point and increase their tendency to jump

To resist high deer pressure on the wire

- use knotted joint woven wire
- and/or, use wire with 6 inch spaced verticals

Figure 1 shows a woven wire deer fence with one electric offset wire and one extra top wire.



Figure 1 Typical Deer Exclusion Fence

WOVEN WIRE JOINTS

Two types of joints are used 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.

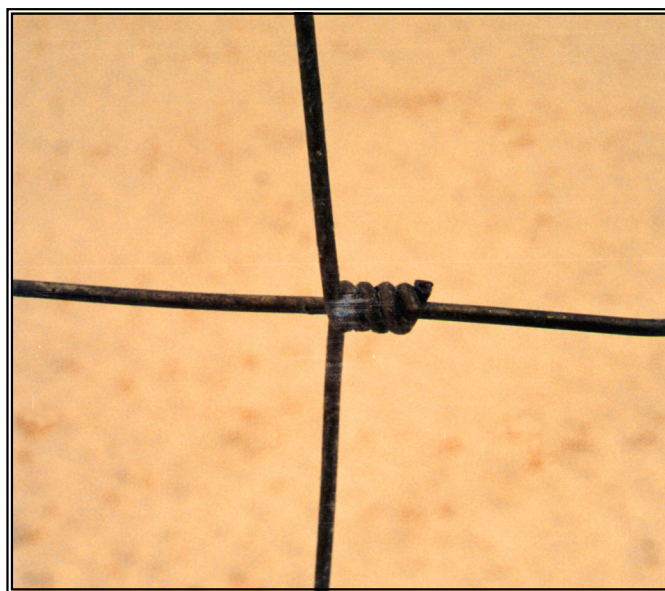


Figure 2 Hinged Joint Woven Wire

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. However, depending on the density of deer and on wire price differences, hinged joint wire may be used as it is a lower-cost wire that is suitable for the typical low-pressure orchard conditions.

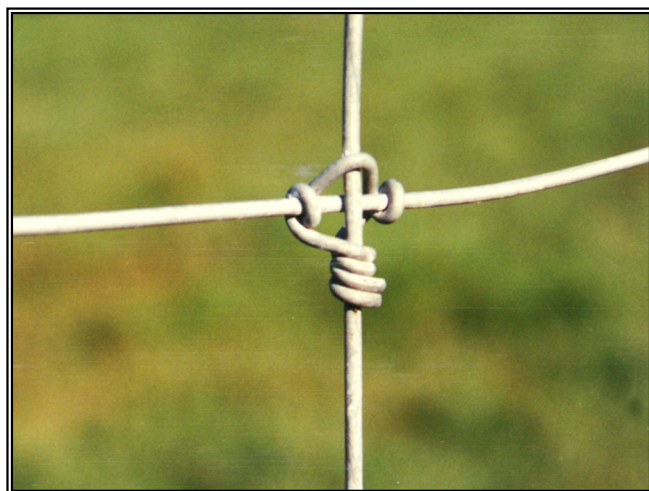


Figure 3 Knotted Joint Woven Wire

INSTALLING WOVEN WIRE

The following points are important when installing woven wire fences:

- Place the wire on the deer side of the line posts. Ensure the wire is flush with the ground and there are no gaps due to terrain irregularities. Deer will go under a fence if it's possible.
- 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 publication No. [307.131-1](#).
- 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.

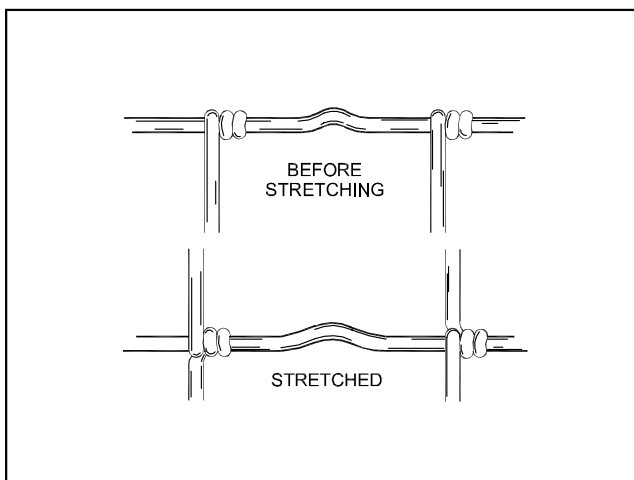


Figure 5 Tensioning Woven Wire

- Tensioning may be done from the end post (then stapling wire tight onto brace post) or from a braced dummy post set 6 ft. to 8 ft. 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.

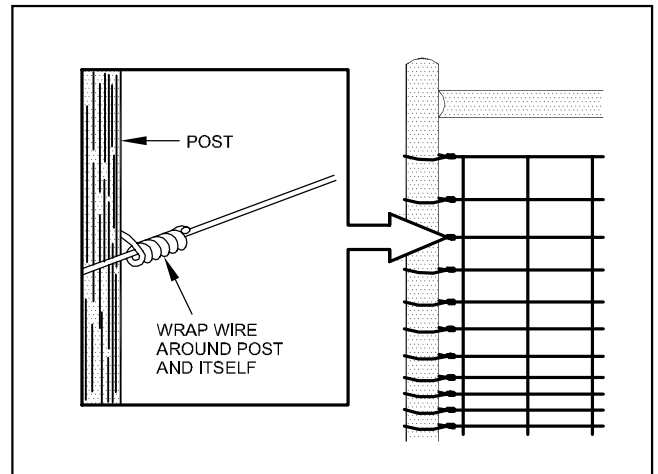


Figure 6 Tying Off Woven Wire

- **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 according to publication No. [307.131-1](#).

FENCE LINE POSTS

Whichever wire configuration is used, the following is recommended:

Minimum Line Post Size- 3 to 4 inch by 12 ft. long

Preferred Line Post Size- 4 to 5 inch by 12 ft. 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 ft apart in level terrain).

FENCE BRACE ASSEMBLIES

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

Figure 7 below is a drawing showing good end brace construction. Note that:

- posts are set in ground minimum 3 feet (4 feet preferred)
- 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 (preferred is 5 to 6 inch) by 12 feet. long set 3 feet. minimum into the ground (preferred is 4 feet); 1 horizontal rail at 4 to 5 inch by 10 feet. long.

This single span brace is sufficient for most conditions but in poor soils (sandy, wet, etc.), use a double-span brace assembly: 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).

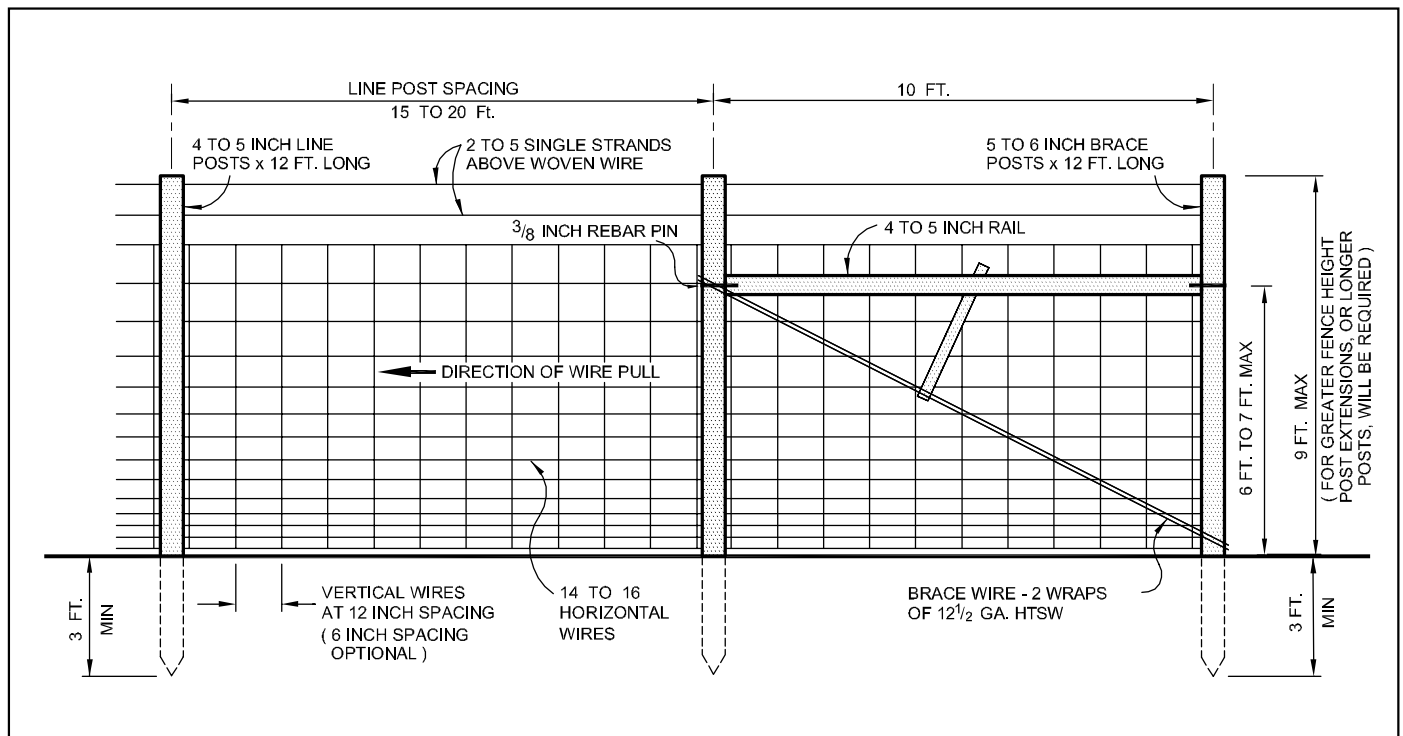


Figure 7 Typical Line Fence and End Brace Design

FENCE EFFECTIVENESS

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

"COMMUNITY" FENCES

Fencing a number of neighbouring operations together can reduce fence costs and improve effectiveness.

FENCE COSTS

The following Tables 1 to 6, pages 5 to 7, outline material and labour costs estimates for both fence designs and with 15 and 20 foot post spacings. Table 7, page 8, shows an example of cost estimation.

Table 2. DEER LINE FENCE MATERIAL COSTS PER FOOT						
LINE FENCE MATERIAL COST PER FOOT (calculated for 15 ft and 20 ft post spacing)				MATERIAL COST PER 15 FEET	MATERIAL COST PER FT	MATERIAL COST PER FT
	15 ft of wire	1 post	12 staples	(line posts, wire, staples)	posts at 15 ft (average conditions)	posts at 20 ft (good conditions)
DESIGN A 14/78/12 woven wire	\$ 10.80	\$ 6.50	\$ 0.18	\$ 17.48	\$ 1.16/foot	\$ 1.05/foot
DESIGN B 16/90/12 woven wire	\$ 12.90	\$ 9.85	\$ 0.18	\$ 22.93	\$ 1.53/foot	\$ 1.36/foot

Table 3. DEER FENCE BRACE AND GATE MATERIAL COSTS						
<p>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 (located 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. An inline brace is the same but with the second brace wire.</p> <ul style="list-style-type: none"> Design A: 2 posts 4 to 5 in x 12 ft \$ 9.20 ea (bundle price) \$ 18.40 Design B: 2 posts 5 to 6 in x 12 ft \$ 16.00 ea (bundle price) \$ 32.00 1 rail 4 to 5 inch x 10 ft \$ 8.40 ea (single) \$ 8.40 2 – 3/8 rebar pins 0.16 ea \$ 0.32 50 ft of 12 1/2 ga. htsw 0.03/ft \$ 1.50 4 ft of 2 x 2 (twist stick) 0.14/ft \$ 0.56 5 + 24 staples 0.015 ea \$ 0.44 \$ 11.22 					(w/GST)	
					\$ 30 each end brace (Design A)	
					or	
					\$ 44 each end brace (Design B)	
<p>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"> Design A: two end braces at \$ 30 (minus one post at \$ 9.20) Design B: two end braces at \$ 46 (minus one post at \$ 16.00) 					(w/GST)	
					\$ 51 each corner brace (Design A)	
					or	
					\$72 each corner brace (Design B)	
<p>GATES – Gates will vary from home built wooden to purchased metal frames, covered with woven wire.</p>					\$200.00 each gate	

Table 4. DEER FENCE ESTIMATED 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).	
<p>LABOUR FOR LINE FENCE CONSTRUCTION</p> <ul style="list-style-type: none"> For posts at an average 15 foot spacing For posts at an average 20 foot spacing 	<p>Estimate \$ 1.00 per foot Estimate \$ 0.90 per foot</p>
<p>LABOUR FOR BRACE CONSTRUCTION</p> <ul style="list-style-type: none"> End brace labour estimate Corner brace labour estimate 	<p>\$ 30 each end brace \$ 45 each corner brace</p>

Table 5. ESTIMATING TOTAL INSTALLED COSTS OF DEER FENCE

Use this table if the amount of line fence, the number of braces, gates, etc are known. Refer to Table 7, Example A.

INSTALLED LINE FENCE

Design A

- Materials
- Labour

Posts at 15 feet

\$ 1.16/foot
\$ 1.00/foot
\$ 2.16/foot

Posts at 20 feet

\$ 1.05/foot
\$ 0.90/foot
\$ 1.95/foot

**\$ 1.95
to
\$ 2.16 per foot
(Design A line fence
installed)**

Design B

- Materials
- Labour

Posts at 15 feet

\$ 1.53/foot
\$ 1.00/foot
\$ 2.53/foot

Posts at 20 feet

\$ 1.36/foot
\$ 0.90/foot
\$ 2.26/foot

**\$ 2.26
to
\$2.53 per foot
(Design B line fence
installed)**

INSTALLED BRACES

- End brace materials
- End brace labour

Design A

\$ 30 each
\$ 30 each
\$ 60 each

Design B

\$ 44 each
\$ 30 each
\$ 74 each

**\$ 60
to
\$ 74 each end brace
installed**

- Corner brace materials
- Corner brace labour

\$ 51 each
\$ 45 each
\$ 96 each

\$ 72 each
\$ 45 each
\$ 117 each

**\$ 96
to
\$ 117 each corner
brace installed**

Table 6. DOING A QUICK ESTIMATE OF DEER FENCE COSTS

Use this table for quick estimates of fence costs prior to a detailed fence plan being available. Refer to Table 7, Example B. The material costs per foot of line fence materials from Table 2 are combined with:

- cost of braces and gates are estimated as a percentage of line fence costs
- labour costs (line fence and braces) can range from 40 to 60% of total installed costs: use 50% as an 'average' (i.e., total cost is half materials, half labour)

FOR INITIAL ESTIMATES ONLY!

MATERIALS:

	Design A	Design B
• Line fence up to (from Table 2)	\$ 1.16/ft	\$ 1.53/ft
• Braces up to 20 % of line fence costs	\$ 0.23/ft	\$ 0.31/ft
• Gates up to 5% of line fence costs	<u>\$ 0.06/ft</u>	<u>\$ 0.08/ft</u>
	\$ 1.45/foot	\$ 1.92/foot

LABOUR:

- Estimate same as materials

TOTAL:	Design A:	\$ 2.90/foot
	Design B:	\$ 3.84/foot

**\$ 2.90 per foot
(Design A completely
installed)**

to

**\$ 3.84 per foot
(Design B completely
installed)**

Table 7. EXAMPLE OF MAKING DEER FENCE COST ESTIMATES

The following two examples are for installation of the **Design A** fence (low deer pressure) with line posts at an average **15 foot spacing**.

Example A. IF THE FENCE LAYOUT DETAILS ARE KNOWN:

USE TABLE 5 (braces and gates are estimated separately)

Assume a 5 acre orchard with the fence line measured and laid out:
2,000 feet of line fence, 8 corner braces, 2 end braces and one gate.

LINE FENCE:	materials and labour is \$ 2.16 per foot x 2,000 feet	\$ 4320
CORNER BRACES:	materials and labour is \$ 96 each x 8 corner braces	\$ 768
END BRACES:	materials and labour is \$ 60 each x 2 end braces	\$ 120
GATE:	materials and labour is \$ 200 for one gate	\$ 200
	TOTAL:	\$ 5408
COST PER FOOT KNOWING THE LAYOUT:		<u>\$ 2.70/foot</u>

OR

Example B. IF ONLY THE GENERAL FENCE LOCATION IS KNOWN:

USE TABLE 6 (braces and gates are part of the per foot cost)

Assume a 5 acre orchard is to be fenced:
approximately 2,000 feet of line fence

MATERIALS:	materials at \$ 1.45 per foot x 2,000 feet	\$ 2900
LABOUR:	labour at \$ 1.45 per foot x 2,000 feet	\$ 2900
	TOTAL:	\$ 5800
COST PER FOOT AS A QUICK ESTIMATE:		<u>\$ 2.90/foot</u>

The quick estimate method for **Design A** fence, with posts at 15 feet, suggests a cost of \$5800 or \$ 2.90 per foot.

With fence measurements and braces known, the estimate is \$5418 or \$ 2.70 per foot.

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