

Factsheet

ORDER NO. 08-035 AGDEX 400/724 MAY 2008
(Replaces OMAFRA Factsheet *Farm Fencing Systems*, Order No. 99-057)

A variety of farm fencing systems for confining or excluding various kinds and sizes of livestock is available today. Although most fencing types have many applications on the farm, there is often one type best adapted to a specific function. This Factsheet discusses the fencing systems available, their application and approximate costs.

For information on a specific fencing type, consult your supplier or see:

OMAFRA Factsheet, *Fencing of Watercourses to Control Erosion*, Order No. 00-049

Canada Plan Service Leaflets:

- *Page Wire Fencing*, Plan 8365
- *Barbed Wire Field Fencing*, Plan 8366
- *Barbed Wire Suspension Fencing*, Plan 8367

FENCING TYPES

Page Wire

Page wire fencing is a permanent fencing type, available in a wide range of fence heights and horizontal spacing, usually constructed on the farm/field perimeters to control livestock, protect crops and enclose pastures; the nine-strand, 1,200-mm (48-in.) high fence is very popular. The ideal fence height and spacing will depend upon the type of livestock to be excluded. Often a single strand of barbed wire is installed on the posts above the page wire fencing, especially where animals, i.e., horses, tend to reach over the fence. Anchor, corner and stretch posts must be wood, but line posts may be wood and/or steel. Use either a long-lasting wood post such as cedar or a pressure-treated post for maximum life. Post spacings are usually 5 m (16.5 ft). Post lengths will depend upon the choice of page wire fencing height; normally a 2.4-m (8-ft) long post with approximately 1.5 m (5 ft) of post above ground is required to exclude cattle and horses. Page wire fencing is very visible to the animals being excluded. This fencing system is normally

more costly to construct than other types, due to higher costs for fencing materials and labour.

Barbed Wire

The more traditional barbed wire fencing consists of four strands of barbed wire stretched on posts approximately 5 m (16.5 ft) apart. Either the double-strand type of wire or the single-strand type may be used. The barbed wire is stretched tight during installation and stapled securely to each post. This four-wire fencing system normally would have the bottom wire 30 cm (12 in.) above the ground and each subsequent wire spaced at 25–30 cm (10–12 in.) intervals, depending on the animals being excluded.

A barbed wire fence is used where a greater repelling action against livestock is required. It is more difficult to handle than other types, because of the barbs, and more susceptible to permanent damage, sagging and failure because it is tightly stapled at each post. It may also contribute to an increased risk of animal injury. A four-wire fence will not have close enough spacing on the wires for small animals.

Suspension (High Tension)

In a suspension fence, the wires move freely between the posts. Impact by an animal creates a whipping action along the fence, discouraging animals from reaching through the fence. Very little of the wire's weight is carried by the line post, while the brace posts absorb the force. Posts are typically placed 9 m (30 ft) apart but can be placed further apart on level ground. Metal or wood droppers placed at 4.5-m (15-ft) intervals space the wires along the fence line. The suspension fence is most effective on level land and has limited application on rough land. It is faster and less expensive to construct than page wire. Single-strand barbed wire and 12.5-gauge smooth wire are used, with the bottom wire usually located 30 cm (12 in.) above the ground. Both fence types require little upkeep.

Smooth Wire Suspension (12.5-gauge high-tensile)

This fence type is versatile and usually has five or more wires. It has more elasticity than barbed wire and is easy to install with the use of a wire spinner. Often used where electric fence is not suitable, such as in urban areas, smooth wire suspension is stronger and easier to install than barbed wire suspension, although it may not be as effective in controlling cattle because of the lack of barbs. Often one or two wires of a smooth wire suspension fence are electrified when built in non-urban areas.

Barbed Wire Suspension

A barbed wire suspension fence can be more effective than smooth wire in controlling some animals, but is more time consuming and tedious to construct. Barbs will catch on the staples, reducing the whipping action, and there is an increased risk of injury to both the fence builder and the animals. Never electrify barbed wire suspension fencing as there is a danger to animals trapped for a significant length of time.

Electric

Electric fencing can be built as permanent or non-permanent (Figure 1). Electric fencing can extend the life of a page wire fence. The high cost and labour of installing and maintaining traditional fences has made electric fencing more attractive.

Proper grounding and fence maintenance are important for the fence to carry an effective charge. Consider using a back-up power source. Solar energy is occasionally used to power the fence. Check with municipal bylaws for regulations on electric fencing.

Training

Electric fencing works as a psychological rather than a physical barrier. It works best when the livestock have been trained to adapt to the fence. Place a charged wire inside the barnyard fence and leave the livestock there to learn about electric fences before putting them out to pasture.

How Does it Work?

A power source, either hydro- or battery-operated, provides a current. Wire carries the current along the fence, and a ground completes the circuit.

An electric fence line with no vegetation touching it requires very little power to maintain high voltage levels. Every plant in contact with a live wire will draw a small amount of current to the ground. With miles of wire, this drain can reduce the effectiveness of the fence. Normally, a fence will have contact with some plant growth; this is referred to as the fence load.

Permanent Electric Fence

Permanent electric fence has two or more 12.5-gauge, high-tensile wires. The number of wires will depend on the type of animals being confined. A predator control fence will require more wires. Posts may be placed at 9-m (30-ft) intervals or greater, depending on topography, with droppers, if required, at 4.5 m (15 ft).

Non-Permanent Electric Fence

A non-permanent electric fence is often used for subdividing a field for pasture rotation. Polywire, 14- or 16-gauge smooth wire or polytape are suitable for temporary fencing. This fence is easy to set up and take down. Plastic or fibreglass posts are quite suitable.

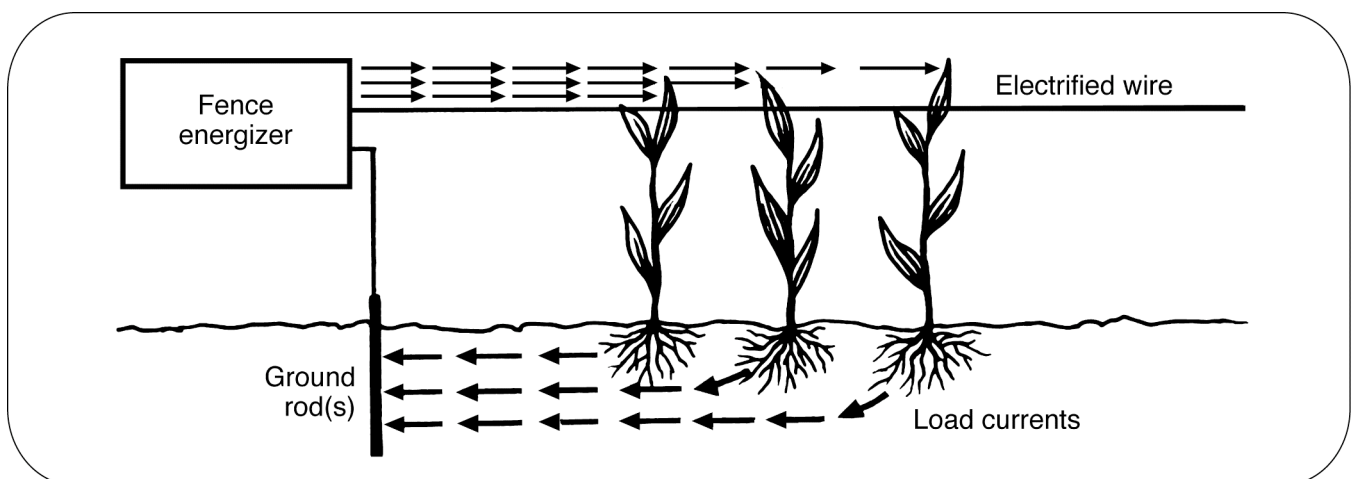


Figure 1. An electric impulse travels from the fence energizer along the wire to plant/animal to ground-to-ground rods and back to the energizer. (Diagram courtesy of Winterburn Enterprises)

BRACE ASSEMBLIES

Corner and end brace assemblies are the foundation of the fence. An entire fence may fail if the brace assembly is not adequate. Suspension fencing relies totally on the brace system to provide support.

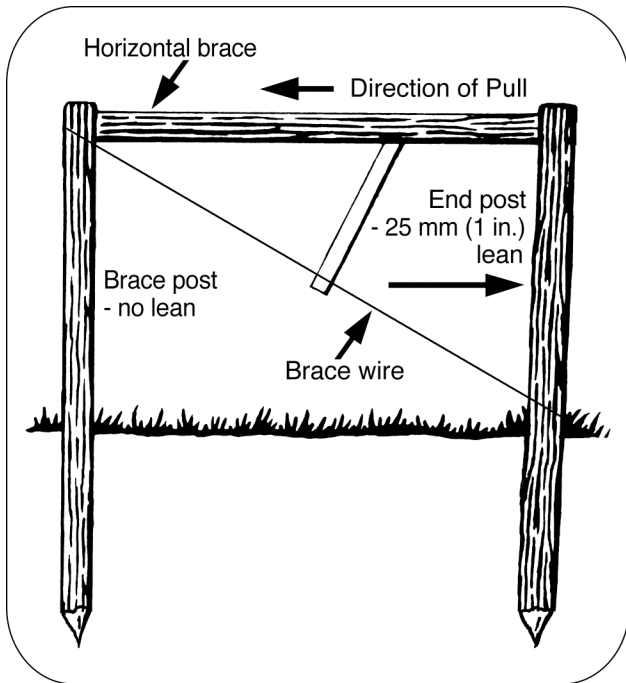


Figure 2. Single-span brace assembly.

The brace assembly shown in Figure 2 has been found to be the most popular type of end-brace assembly. This design has adequate strength, is easy to build and is aesthetically pleasing. For a strong brace assembly, use minimum 150-mm (6-in.) top diameter brace posts, driven 1.2 m (4 ft) into the ground in firm soil, deeper in soft soil. A top horizontal brace should be twice as long as the height of the post above ground but never less than 2.4 m (8 ft). Install a twitch or brace wire diagonally between the posts.

Install an in-line brace assembly along the fence midway between end-brace assemblies but at a maximum interval of 400 m (1,320 ft or 80 rods). An in-line brace assembly can be constructed as a double or single span brace assembly depending on the type of fence. Use only brace posts with no lean for an in-line brace assembly. A corner brace assembly consists of single-span (Figure 2) or double-span (Figure 3) brace assemblies located at right angles to each other. When the double-span brace assembly is used as a corner or in-line brace (Figure 3), it is stronger than the single-span, if constructed properly. It would be used as an end brace assembly only if the fence has several wires or if the soils have very poor cohesive properties, such as sandy soil. Designs for brace assemblies may vary depending on contractor preference and/or site conditions.

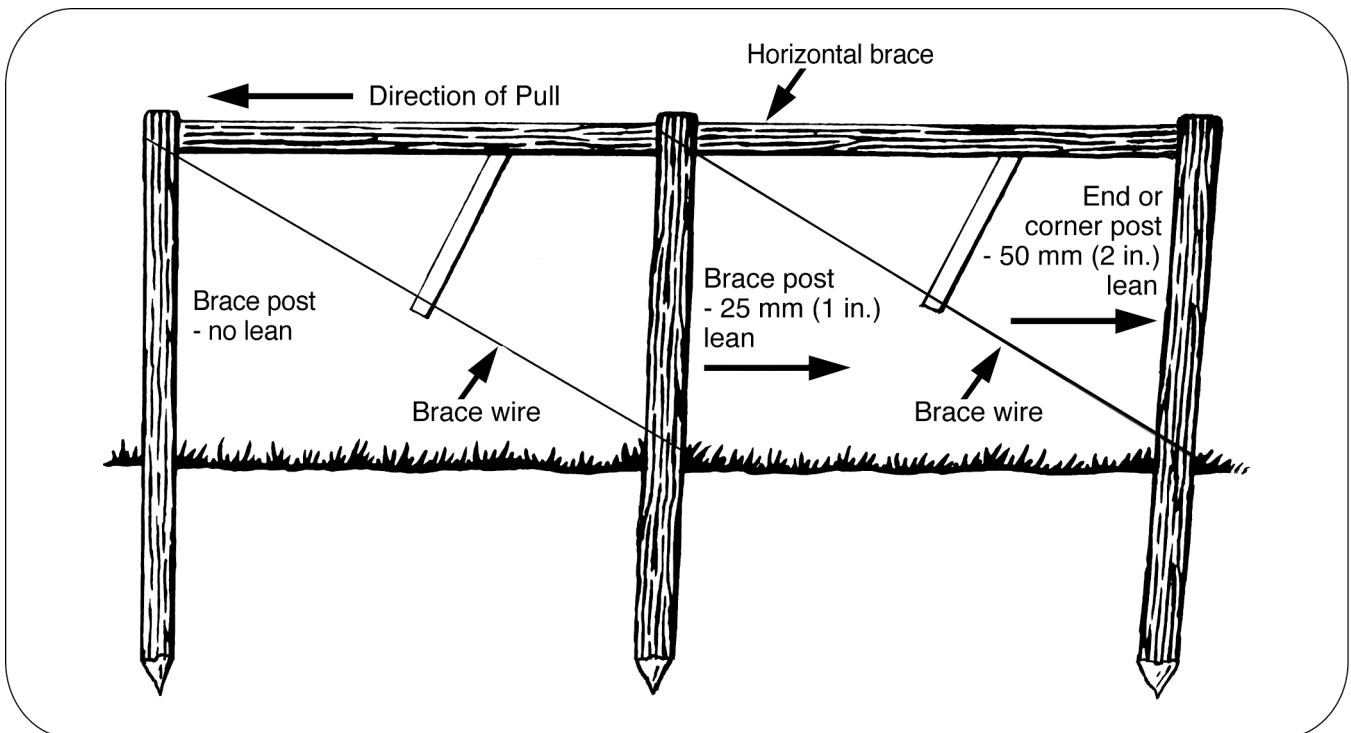


Figure 3. Double-span brace assembly.

Table 1. Fencing Costs for 400 m (1,320 ft) (80 rod) of Various Fencing Types.

(Fencing costs are average costs for the province. Costs will vary depending upon the location in the province, roughness of the terrain, proximity to bedrock, presence of bush and the actual design of the fencing system, i.e., post spacing, etc.)

Material	Page Wire ¹ 9 Strand 12.5 gauge		Barbed Wire ¹ Double Strand 4 wires		Suspension Smooth Wire ³				Electric Permanent ² 12.5 gauge 2 wires	
	# Units	Cost (\$)	# Units	Cost (\$)	12.5 gauge 6 wires (2 electric) ²		12.5 gauge 8 wires		# Units	Cost (\$)
					# Units	Cost (\$)	# Units	Cost (\$)		
Cedar 6-in. posts @ \$13	24 posts	312	24	312	44	572	44	572		
Cedar 5-in. posts @ \$9									44	396
Steel posts @ \$10	55 posts	550	55	550						
Page wire @ \$2.50/m (\$0.75/ft) (\$12.50/rod)	80 rods	1,000								
Barbed wire @ \$0.23/m (\$0.07/ft) (\$93/80 rod) (double strand, 12.5 gauge)			320	372						
Smooth wire @ \$0.13/m (\$0.04/ft) (\$52.77/rod) (12.5-gauge, high-tensile)					480	317	640	422	160	106
Single-span brace assembly	2	170	2	170	2	130	2	130	2	130
Double-span brace assembly	1	145	1	145						
Insulator @ \$0.56 ²					88	50			88	50
Staples @ \$4.40/kg (\$2/lb)	7 lb	14	7 lb	14	7	14	14	28		
Strainer/Tensionmeter					1	40	1	40		
Droppers @ \$4 ³					88	352	88	352		
Energizer @ \$350					1	350			1	350
Total Cost for Materials/400 m⁴		2,191		1,563		1,825		1,544		1,032
Labour @ \$30/hr	42 hr	1,260	38 hr	1,140	40 hr	1,200	43 hr	1,290	25 hr	750
Total Cost/400 m⁴		3,451		2,703		3,025		2,834		1,782
Cost per 0.3 m (1 ft)		2.61		2.05		2.29		2.15		1.35

¹ Post spacing: 15 m (50 ft or 3 rod) for 150-mm (6-in.) posts and 5 m (16.5 ft or 1 rod) for intermediate steel posts.

² Insulators (2) for electrified suspension smooth wire and electric permanent fences are placed on each post @ 9-m (30-ft) centres.

³ Droppers are spaced midway between posts at 4.5-m (15-ft) centres on suspension smooth wire fencing.

⁴ (1,320 ft) (80 rod).

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