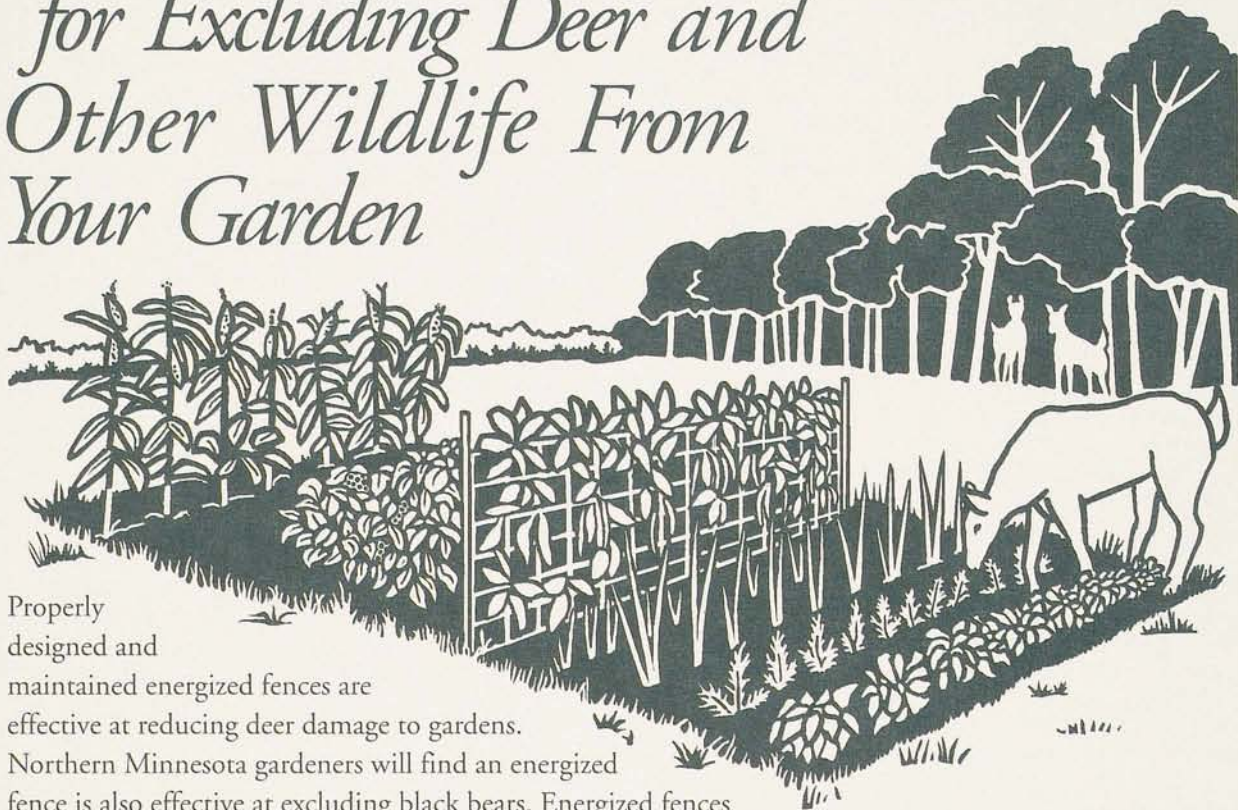


Energized Fence Guidelines

for Excluding Deer and Other Wildlife From Your Garden



Properly designed and maintained energized fences are effective at reducing deer damage to gardens. Northern Minnesota gardeners will find an energized fence is also effective at excluding black bears. Energized fences are inexpensive to maintain and can last for many years. However, an energized fence is *not* a physical barrier against animal entry. An energized fence acts as a psychological barrier which some animals will continually test for an entry location. It is important that an energized fence be properly installed, maintained, and powered at *all* times. For best results, install and energize your fence prior to spring planting.

NOTE: Check local fencing ordinances before investing in an energized fence. They are prohibited in some municipalities.



Wildlife Damage
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Fence Design

Figure 1 presents a fencing option popular with many gardeners. Other combinations of materials are possible, provided that these four critical components are included: 1) a high voltage, low impedance energizer capable of delivering a minimum of 5000 volts to the fence under all conditions, 2) an adequate electrical grounding system, 3) proper wire and post spacing, and 4) routinely monitor the fence power status with a digital voltmeter.

Energizer

- A high voltage, low impedance energizer delivers a short (0.003 second), painful, but safe shock to deer. The short pulse will not set fire to plants contacting the wires, nor injure humans or animals.
- Energizers may be powered by 110-120 volt household current, a 12-volt battery, or D-cell alkaline batteries.
- Household current (110-120 volt) is the most reliable and maintenance free power source for most gardeners. Electrical costs are minimal. Deep cycle marine batteries are recommended for 12-volt energizers. Solar panels are simply a recharging system for battery powered energizers. Use 110-volt energizers for gardens that require year-round protection.
- Install 110-volt energizers in a shed, garage, or other building and bury insulated underground cable from the energizer to the fence. Protect your 110-volt energizer with a single outlet surge protector. Hang D-cell energizers directly from the fence wire.
- Install the energizer and grounding system prior to installing posts and wire. Energize all fence wires.
- Remember, the shocking power of the fence deters the deer. The fence is the delivery system; it is not a physical barrier and will not be effective unless constantly energized (turn the fence off only for maintenance).

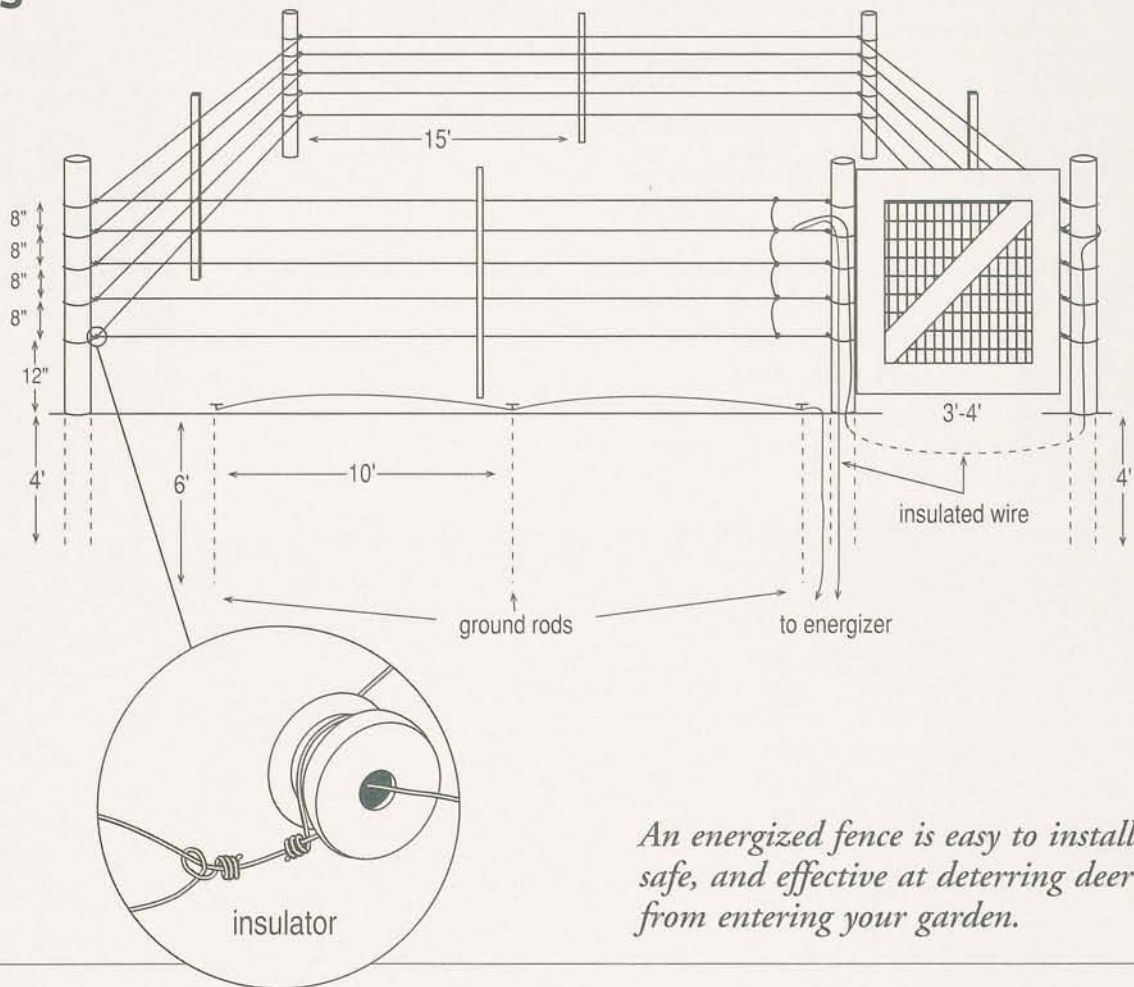
Grounding

- Use a minimum of three, 6-foot galvanized steel grounding rods. Avoid copper. Additional rods may be necessary in sandy soils. Drive ground rods so that approximately 3–4 inches remain above the surface to attach the ground cable from the energizer.
- Place ground rods at least 10 feet apart in the wettest soil available.

Wire and Posts

- Recommended wire spacing for deer from the ground up: 12", 20", 28", 36", and 44".
- Use 8-foot by 4-inch treated wood posts with insulators at the corners. Place the wide end of wooden posts 40–48 inches in the ground. Lean corner posts slightly away from the pull of the fence. Back fill and tamp wooden posts. You will need at least 46 inches of the post above ground.
- You may use electroplastic or polywire, seventeen gauge steel wire, or light gauge twisted steel cable. Polywire with a minimum of nine strands of stainless steel wire is recommended. Polywire is easier to use than steel wire. However, it is more costly and not as durable. Use light gauge steel cable or wire around gardens that require year-round protection.
- Adjust wire tension by hand pulling to remove visible sag, and hold with knots on the ends. Spring-type gate handles (Figure 2) also serve to maintain tension. Use small tension springs with twisted steel or seventeen gauge wire.
- Use porcelain or heavy duty plastic insulators on wooden corner posts.
- Wooden posts with insulators, fiberglass, or ½" Schedule 40 PVC plastic pipe are recommended for line posts. To prevent shorting, avoid using steel posts with insulators.
- Place line posts no more than 15 feet apart.
- Many gardeners prefer to leave a 4- to 6-foot-wide area between the fence and garden to maneuver wheelbarrows and tillers.

Figure 1



An energized fence is easy to install, safe, and effective at deterring deer from entering your garden.

Voltmeter

A voltmeter is essential for monitoring the fence power and trouble shooting. Digital voltmeters are available from energized fence manufacturers.

Maintenance

Check voltage weekly or after storms. Check and tighten wire tension as needed. Change or recharge energizer batteries every 3–4 weeks. Vegetation must not contact the fence. Use mowing, weed whipping, or herbicides to control vegetation on an 18-inch-wide strip under the fence. Apply herbicides according to label directions.

If your garden needs protection only during the growing season, take wires and line posts down during the winter. Use a wire or garden hose reel to gather and store the wire. Corner posts and ground rods may remain in the ground. Cover the exposed end of ground rods with buckets, bricks, or concrete blocks. With proper care, your garden fence should last ten or more years.

Safety

Safety is a primary concern when using an energized fencing system. The homeowner is responsible for protecting others from injury. Use only an unaltered energizer listed with a qualified electrical test-

ing laboratory. Always follow the manufacturer's safety recommendations. Use at least one energized fence warning sign on each side of the fence. Check local ordinances for regulations on energized fences and posting requirements.

Rabbits, Raccoons, and Woodchucks

To exclude rabbits, raccoons, and woodchucks in addition to deer, add wires at 4- and 8-inches above the ground. This may be part of the initial design or added later as needed. You will need additional insulators, wire, and fence staples beyond those listed in Figure 3.

Other Considerations

Gates

Many gardeners prefer a permanent gate (Figure 1). The width of the gate will vary according to your needs. Spring-type gate handles (Figure 2) may also serve as the gate. A fiberglass or plastic rod may be used so all wires are opened simultaneously. You may prefer two gates for larger gardens.

Other Energized Fence Designs

Other energized fence designs to exclude deer from gardens do exist. The energized fence design described here will give most home gardeners the best opportunity for reducing deer damage. If you are currently using an energized fence that is effectively reducing deer damage, great. However, if you are experiencing problems with your current fence or are considering an investment in energized fencing to protect your garden, consider the design specified in this brochure. *Caution: Failure to carefully follow the recommendations specified in this brochure may result in deer breaching the fence. Once deer learn to enter the fence, you may not be able to retrain deer even if you upgrade your fence.*

Fence Material Sources

LaCrescent Farm & Orchard Supply
Box 143
LaCrescent, MN 55947
(507) 895-2103

Eikmeier Livestock Systems
Rt 4 Box 204
Pipestone, MN 56164
(605) 997-2022

Shepard's Hill Farm
Dave Deutschlander
Rt 4
Pine City, MN 55063
(320) 629-2744

Waconia Farm Supply
801 S Hwy. 284
Waconia, MN 55387
(612) 442-2126

K-Fence Systems
RR 1 Box 195
Zumbro Falls, MN 55991
(506) 753-2943

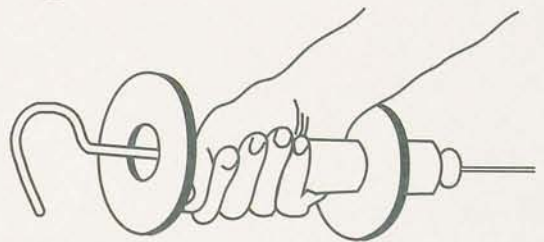
ABK Power Fence
2501 Surrey Ct.
Lincoln, NE 68512
(402) 335-4069

Premier Fence Systems
Box 89
Washington, IA 52353
(800) 282-6631

David McIver
RR 1 Box 201
Farwell, MN 56327
(320) 283-5776

Kencove Farm Fence
111 Kendall Ln.
Blairsville, PA 15717
(800) 536-2683

Figure 2



Spring-type gate handle

Figure 3

Materials list and price estimate (1997) for a 30' by 30' energized garden fence to exclude deer.

| Quantity | Source | Description | Unit Cost | Total Cost |
|----------------------|--------|---|-----------|------------|
| 1 | G | Energizer (at least 1.0 joule) | 85.00 | 85.00 |
| 3 | G | 6' galvanized ground rods with clamps | 8.00 | 24.00 |
| 1 | G | Digital voltmeter | 60.00 | 60.00 |
| 5 | F | 8' x 4" round treated posts | 6.00 | 30.00 |
| ½# | F | 1 ¾" galvanized fence staples | .50 | .50 |
| 125' | F | 12 or 14 gauge steel wire to attach porcelain insulators to wood posts | | 4.00 |
| 25 | G | Porcelain doughnut insulators | .30 | 7.50 |
| 165' | G | 14 gauge insulated underground cable | 35.00 | 35.00 |
| 4 | F | ¾" x 48" fiberrod posts | .80 | 3.20 |
| 20 | F | ¾" post clips | .20 | 4.00 |
| 4 | G | Fence warning signs | 2.00 | 8.00 |
| 1 | H | 48" x 48" wooden gate (make) with hinges | 50.00 | 50.00 |
| 1 | G | Polywire (655' roll) | 31.00 | 31.00 |
| Estimated total cost | | | | \$342.20 |

Source: G=Energized fence supplier F=Farm supply store H=Lumber and hardware retailer

More Information

Fencing Displays

Fencing displays can be seen at the Minnesota Landscape Arboretum. The Arboretum is located nine miles west of I-494 on State Highway 5 in Chanhassen (for hours and directions, call (612) 443-2460 ext. 102). Fencing displays are a cooperative venture between the Minnesota Department of Natural Resources, the University of Minnesota, and fencing companies. Labor and materials provided by Gallagher Power Fence Systems, San Antonio, TX; K-Fence Systems, Zumbro Falls, MN; and Kiwi Fence Systems, Inc., Waynesburg, PA. For directions, refer to the map below or inquire at the Arboretum's front desk in the Snyder Building.

MINNESOTA LANDSCAPE ARBORETUM

