

# **BEARPROOFING BEEHIVES**

**A PRACTICAL GUIDE FOR**

**REDUCING BEAR DAMAGE**



Compiled by the  
Vermont Bearhound Association

## **INTRODUCTION**

Black bear depredation is an occurrence that all  
Bee keepers dread. This booklet details bear proof electric fence designs that have proven effective  
in the United States, Canada, and in Europe, (against the European Brown Bear!)

For technical assistance in electric fence construction please contact one of the Vermont Bear Hound Association members listed below.

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### **Overview**

Electric fencing is extremely useful for areas where a bear attractant exists and cannot be removed such as landfills, orchards and apiaries. Seasonal electric fences have also been used with great success to eliminate human-bear interactions at two high use visitor areas, including a campground, in Lake Louise in Banff National Park.

Factors affecting the effectiveness of electric fences include the type of wire, fence height, and spacing between wires. Overhangs, mats, concrete footing or buried chain link fences at a depth of

1-1.5 m (3-5 ft) prevent bears from digging under or climbing over fences. Electric fences deliver pulsating charges of electricity. For safety, the interval between pulses should not be less than  $\frac{3}{4}$  of a second.

Electrical considerations include the wire strength and the existence of a reliable fence charger and grounding system. Intensity of the electrical charge is also an essential factor determining the success. Long-haired animals require a minimum voltage of 5,000 volts to receive a shock. The voltage can be 10,000 to 12,000 volts with amperage of one or less to deliver a painful shock depending on the grounding system and the total amount of resistance. If barb wire is used, its points may better penetrate into the hair of bears increasing the likelihood of shock, but it can endanger persons whose clothing might become snagged during accidental contact, preventing escape from the charge.

Once a fence has been installed, it is essential that it be properly maintained in order for it to be effective as bears may periodically retest fences. Maintenance includes keeping the chargers working properly and removing weeds and other debris from touching and shorting out the fence. A good grounding rod is also essential.

Portable electric fence units have become fairly inexpensive and simple to erect. Even a back packers version is available. They have been used by field researchers and hunters for years to successfully deter bears from field camps. A biologist in Minnesota reported good success deterring bears from repeated attacks on beehives by using a temporary prefabricated fence with a charger powered only by D-cell flashlight batteries. The key in this instance was liberally applying foil strips smeared with peanut butter and honey to the hot wires about 20"-24" in (50-60 cm) above ground or at head height for the bears. The strips would be torn off by morning, but the bears respected the jolt they received and did not break down the fence. Solar charged units are also available.

Researchers have adapted portable fence units to other items that they want bears to stay away from. For example, the "electric lunchbox" is a small picnic cooler that has been fitted with an apparatus adapted from a portable electric fence unit that gives the bear a shock when it tries to

remove the bait. In initial tests, the electric lunchbox has caused black bears to run from the area and avoid the cooler when they returned.



### **ELECTRIC FENCING CONSTRUCTION**

Properly installed electric fencing is the most effective and efficient method of preventing bear damage to livestock, beehives, crops, silage bags, orchards, gardens and compost piles.

#### **Construction**

Fence construction should be simple and as strong as possible.

The following method of fence construction is effective and easy to erect

- Drive corner posts. Use wooden posts and reinforce them with braces. Remove grass and weeds in an 18 inch strip along the fence line.
- Spray the cleared area with a herbicide to prevent the return of vegetation. Do not spray wider than 18 inches because the bear will be better grounded if it is standing on grass.



- Use five strands of high tensile wire, barbed wire or electro net at 4 inches, 16 inches, 26 inches and 36 inches above the ground. Stretch the wires to eliminate sagging. Use stones or weights to keep the wires at the correct heights when going over low areas.
- Leave extra wire at the knot so it can be wrapped around the lower wire to complete the circuit.
- Use a minimum voltage output of 3,000 volts. Verify this with a voltmeter. Energizers should be compatible with the type of wire used. Check the manufacturer's recommendations to be sure that all the requirements are met.
- Locate the fence posts 12 feet to 15 feet along the fence line. Install the insulators and wire.
- Energize all wires in the fence system. The battery should be located inside the enclosure. When possible, use direct current for the initial two months, then switch to battery or solar power.

Drive the ground rod 5 feet to 7 feet into moist soil.

### **Baiting the Fence**

Bait the wires on the electric fence to direct a mild shock onto the muzzle area of a black bear.

This makes the fence much more effective, regardless of the size of the bear.

### **Maintenance**

The following tips are offered to ensure proper maintenance and effectiveness of your electric fence.

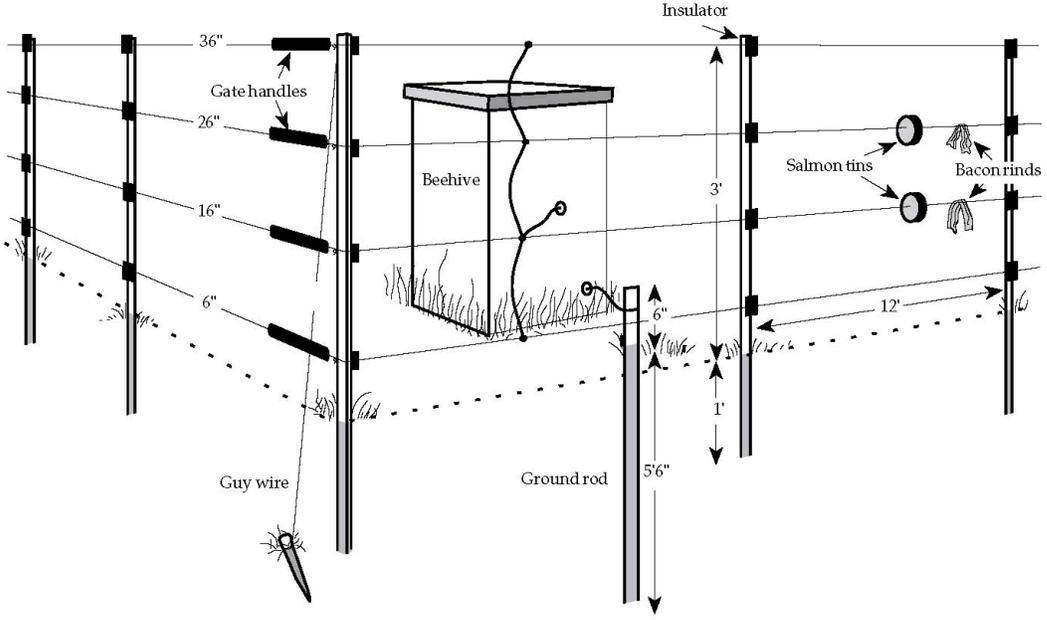
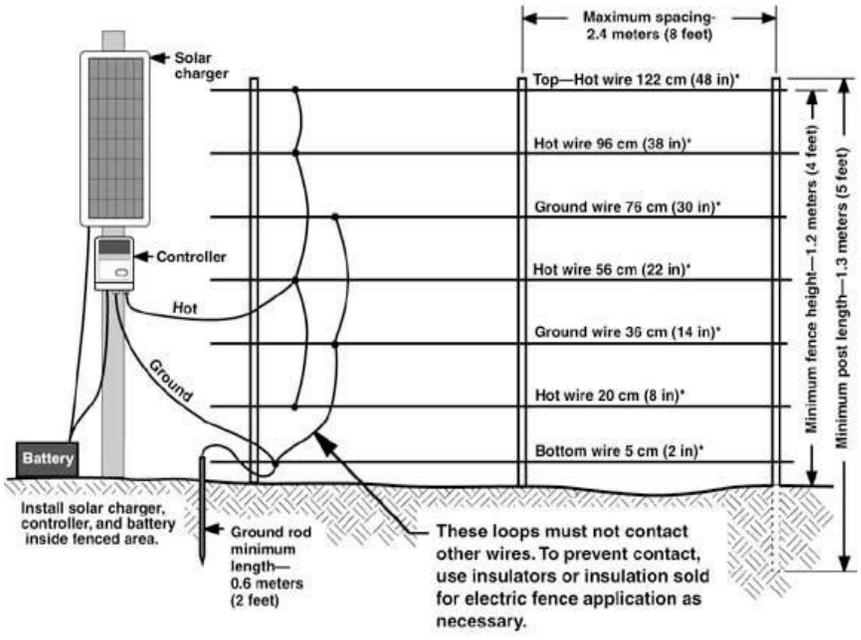
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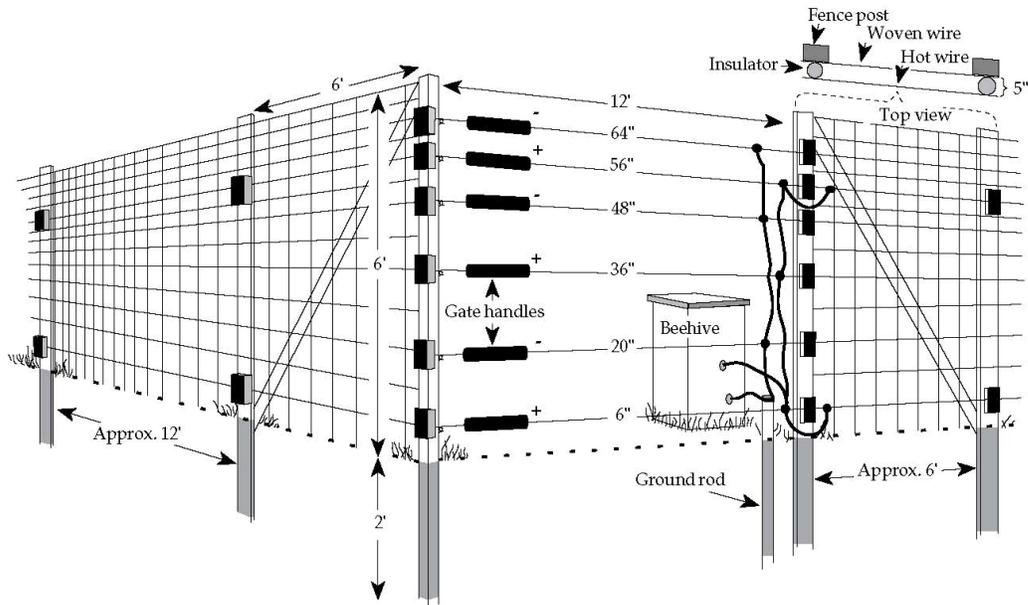
- Make sure the wires are tight.
- Change the batteries as needed.
- Drop loops in wires are beneficial.
- Use at least a 70-amp hour battery.
- Consult your supplier for the correct high output fence charger.

- Check voltage with a voltmeter.
- Marine battery terminals and lead composition eyelets resist corrosion.
- Keep wires baited at all times.

Remove vegetation that may be touching the wires.

### **Various Electric Fence Setups**





### Unwelcome Door/Window Mat

Unwelcome mats are basically boards full of nails pointing up that are placed in front of doors and windows to discourage bears from entering buildings.

Unwelcome mats are simple and inexpensive to make. The sheet of plywood must be large enough so that a bear cannot lean from one edge and reach the door or window and should ideally extend past the sides of the door or window by 60 cm (2 ft). A 4x4 sheet of plywood would provide minimal protection for a single doorway, while a 4x8 sheet will be needed for most sliding patio doors. Use the thickest plywood possible and galvanized roofing nails with the large flat head. The nails should be long enough to stick out of the wood 2 - 2.5 cm ( $\frac{3}{4}$  - 1 in). If the nails are too long and not strong enough, the bears will discover that they can simply bend them over and step on them. The nails should be nailed into the board about 5 cm (2 in) apart so that there is no way a bear can get his paw on the board.

The sheet of plywood also has to be secured so that the bear cannot simply push it out of its way. If it is placed on a wooden surface, a couple of nails pounded through the plywood should secure

it. If the mat is placed on dirt, pieces of rebar can be pounded through the corners into the ground to secure it.

Caution tape should be placed around the area of the mat so that people do not accidentally step on the nails.

### **“Unwelcome” Mat Detail**



