

**Wildlife Division
Michigan Department of Natural Resources
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For additional information related to this research project, see “Developing and implementing effective black bear exclusion fences to protect mobile apiaries,” by T.E. Otto (2013) at www.fw.msu.edu/~roloff/wp-content/uploads/2014/04/T.-Otto-Thesis-201 or email tammy.otto@gmail.com



You can protect your beehives from black bears



MICHIGAN STATE UNIVERSITY | College of Agriculture and Natural Resources



Michigan State University, in cooperation with Michigan Department of Natural Resources, designed and tested an electric fence option. The design outlined in this brochure was found to be 100% effective at deterring bear access to the hives and preventing significant breach of the fencing.

What You Need

For a single fence enclosing a 12' x12' area, as illustrated below, materials consist of the following and cost approximately \$250*

A - Four 6'x1.5" fiberglass rods (one for each corner)

B - Eight 43" step-in posts

C - Three 48' x 0.5" white polytape ribbons

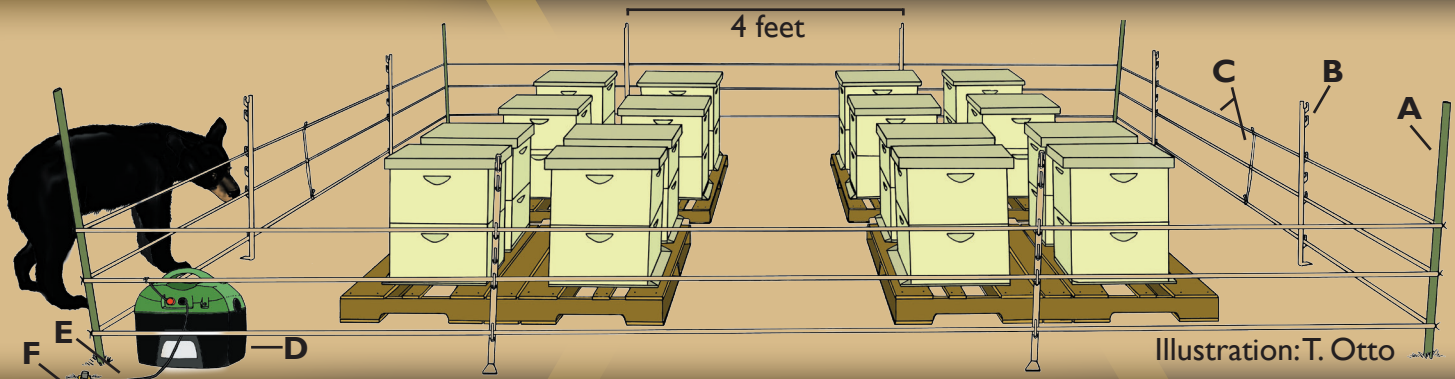
D - One battery-powered fence energizer

E - Double-insulated wire (rated for 20,000 volts)

F - One 4' x 0.5" galvanized grounding rod

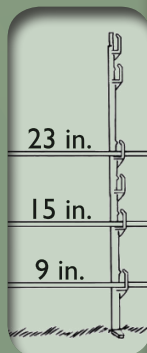
Volt meter

* Cost may be reduced by purchasing a less powerful fence energizer.



Construction

- Place poles in a square around hives. Use the fiberglass rod for each corner and step-in fence posts in between at a 4ft spacing. Keep fence at least 2ft from hives.
- Create three tiers of half inch polytape at the heights indicated in the illustration to the right. Tier spacing was found to be critical to fence effectiveness.
- Using another piece of polytape, connect the three tiers of polytape together at opposite sides of the fence.
- Connect fence energizer as instructed in the owner's manual.
- Connect double insulated wire to energizer and grounding rod after driving grounding rod into ground.
- Turn on energizer and, using voltage meter, check voltage on polytape and grounding wire. Maintain a voltage of 3,500-7,000 on the polytape. If more than 200 volts are detected on the grounding wire, grounding should be improved.



Maximizing Efficiency

- If desired, you may add an additional tier at 3ft but the other three tiers should remain as indicated.
- Use a low-impedance fence energizer based on Joule rating rather than voltage-output rating. In general, 0.5 Joule is needed for every three miles of charged polytape. (One-mile fence with three charged tiers = three-miles of charged polytape.) A low-impedance energizer maintains high energy levels despite weed conditions and is safer than a high-impedance energizer.
- Consult your energizer manual on proper fence setup as it may differ from one energizer to another.
- Additional grounding rods can increase voltage. In very dry soil conditions, chicken wire laid flat along the soil and connected to the grounding rod can also improve grounding.
- Clear the fence area of anything that could fall onto or touch the polytape. Material touching the fence will drain electricity from the fence. Larger material, such as branches, can damage the fence.
- Check fence, battery charge, and voltage at least once every two weeks.
- The shock felt by the animal will be reduced when the fence is insufficiently grounded or there is an additional load on the fence.