



Protecting Honey Bee Hives in Wild Blueberry Fields

When honey bee hives are placed in blueberry fields for pollination, it is important that they are properly protected from bears. Bears visit hives and cause damage in their attempt to acquire brood and honey (Figure 1). Once the bears discover this food source, they will typically return on a regular basis and cause more damage. Depending on the extent, bears can cause the total loss of the colony, plus loss of honey that the hive would have produced over the season. Therefore, protective measures should be in place before the hives are brought in to the field for pollination.

Electric fences are the most common form of protection that are used to ward off predators. When the hives are rented for pollination, the grower and the beekeeper need to determine who is to be responsible for installing and maintaining the protective enclosure. It is important to address protection when drawing up a pollination contract. Most often it is the responsibility of the blueberry grower to provide protection of the rented hives while they are in the field.

Electric fence (Figure 2):

An electric fence is the most effective method of protecting hives from bears. To be effective, the fence needs to be properly installed and maintained often. Equally important to the fence itself, is making sure you have a good ground, especially in blueberry fields where the soil is typically sandy. When shopping for an electric fencing system, the grower/keeper should ensure that the components are adequate for deterring predators. The components of a good electric fence are:



Fig 1. Example of a poorly fenced apiary that resulted in excessive bear damage to one hive. The fence was placed too close to the hives, and only two strands of polywire were used for the fence.

- **The energizer (charger).** A wide variety of energizers are available for several uses. When selecting an energizer, it is important to check the unit's power, which is measured in joules. To deliver a sufficiently powerful shock to deter a bear, the charger should supply 0.7 to 1.3 joules. Although costly, solar-powered energizers are by far the best energizers available and are recommended. A battery powered energizer hooked to a 12-volt battery (or 6 D cell batteries) is also another option. Battery powered energizers are less expensive to purchase, but the grower/keeper must make sure that the batteries are always fully charged. With a properly set out solar fencer, the grower/keeper have less to worry about. When using a battery system, the energizer and battery can be placed in an empty hive body with a lid within the area enclosed by the fence, the energizer runs off 12 volt battery.



Fig. 2. Example of a temporary bear fence made with metal step-in fence posts and UV resistant polywire. The energizer runs off 12 volt battery.

- **The ground.** Proper ground is important when creating any electric fence system. Under dry sandy soil conditions, the soil is not a good conductor and it is very important to make sure you are getting proper a ground. Without a proper ground, the electrical unit is not effective and will not deliver a strong shock, even if the system is very strong. Even if an area is fenced, bears still may “test” the fence. If the shock is not strong enough to initially deter the bear, one or multiple hives may be destroyed over the course of just one night. Galvanized ground rods driven at least 1 m (3-4 feet) into the soil usually do an adequate job. Rebar may also be used if driven at least 1.3 m (4 feet) into the ground, but galvanized rods are better. It may be advantageous to drive 2 galvanized ground rods into the ground 2-3 m (7-9 feet) apart to ensure adequate ground. Under dry soil conditions or after a bear has initially gotten through the fence, it may be worthwhile to install chicken wire 15 cm from the base of the fence and all the way around it. The chicken wire should not touch the electrical cords, but should be attached to one of the ground stakes near the fence.
- **Electrified wires.** The type of electrified wire used will depend on the type of fence. For a permanent fence, a high tension metal wire is recommended. For a temporary fence, a thin high conductivity “polywire” is recommended. A polywire system is easy to install and use. When opting to use polywire, it is recommended to use the UV resistant polywire with a minimum of 6 strands. Spending a little extra money and buying the polywire with the copper coated strands is recommended. Copper strands are more conductive than stainless steel to ensure maximum protection.

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To adequately protect the hives, a minimum of three wires should be installed. Some growers/keepers may prefer to use 4 strands, however fewer than three strands is not recommended. These strands should be placed at heights of approximately 24, 50, and 85 cm above the soil. An additional strand may be placed at 105 cm above the soil if required. The wires need to be connected in order to ensure that the current passes through all of them and the fence should be routinely maintained to make sure grass and weeds don't grow up and touch the lower wire and cause the fence to ground out. In areas with specific bear problems, it is possible to "train" bears to a fence. Using a lard "bacon" bait, you can entice the bear to touch the electrical wire with his snout or his tongue. This will result in a more powerful and memorable shock and "train" him not to try the fence again. This is not required in all situations but can be used if the bears have already visited the beehives or made it inside the fence once.

- **The posts.** The corner posts should be well anchored to the ground while the others should be installed 4 m (13 feet) apart and will define the perimeter of the beehive area. These posts can be made of wood or metal. 3/8" rebar cut to lengths of 1.2 m (4 feet) make good posts that can be quickly installed and can easily be driven in rocky soil, which is characteristic of many blueberry fields. It is important to have the fence posts at least 1 meter (3 feet) away from where the bee hives will be sitting to reduce the chance of a bear being able to reach into the fence and pull over a hive. Insulators are necessary and fit easily over rebar posts. The insulation stops a ground from being created by way of the posts.
- **Electrified gate.** The electrified gate consists of simple spring or thin polywire, attached to the end of a handle. The number of gate handles should be equivalent to the number of wires. For less permanent fences, you can make a gate by doubling up posts in one corner.

Woven wire fence

Some growers prefer to use barrier fences which are not electrified, however this is not recommended. This decision is usually based on the cost of electric fencing and also on the number of apiaries which need protection. The woven wire fence is a permanent structure. It is not electrified and therefore needs to be extremely sturdy in order to prevent the bears from reaching the hives.

- **Posts.** Four metre cedar posts, pounded to a depth of 1 m, and placed at 3 m intervals will define the perimeter of the beehive area. The corner posts should be well anchored to resist the tension of the woven wire. The base of the posts should be treated, to prolong the usefulness of the posts.
- **Woven wire.** Two series of woven wire (10 or 15 cm mesh), one laid over the other, can be used to cover the full height of the posts. The lower one is dug 25 cm into the soil. It is very important to secure these solidly.
- **The gate.** The gate allowing access to the interior of the enclosure should be solid. It can be framed by metal or wood. The interior of the frame can be covered with woven wire.

Conclusion

In order to avoid significant losses, it is important to maintain good communication between the grower and the beekeeper, regardless of the understanding with respect to hive protection. Since the grower is more frequently in the field, they should advise the beekeeper of any potential problems.

References

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- For more information on honey bees and wild blueberry pollination. July 2020. <https://www.perennia.ca/portfolio-items/honey-bees/>.

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