

Are You Grounded?

“ I do not think it is ever one factor that leads to electric fencing failures but a number of small ones that compound on each other .”
Albert Kuipers,
Grey Wooded Forage Ass.

Forage Fact Objectives

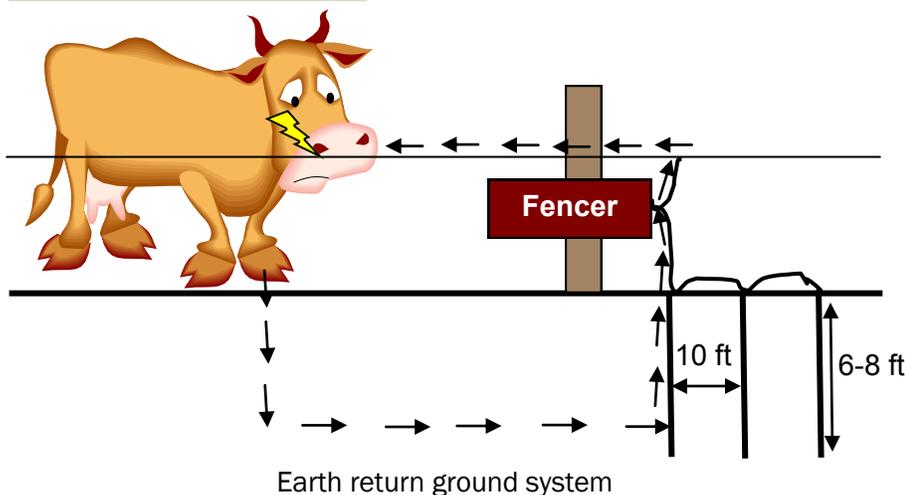
Electric fencing is the key component to a 3-dimensional fence as it is a psychological barrier not a physical one. The largest cause of failure with this wildlife fence is a failure in electric fencing. Without a proper functioning electric fence wildlife will quickly discover they can penetrate the fence without receiving a

negative reinforcement. Proper grounding is essential for an electric fence to perform correctly. There are two common grounding systems used in electric fencing:

1. Earth return system - used in the Peace Region and,
2. Hot/cold system - used in southern BC.

Earth Return Ground System

The earth return ground system can be seen all throughout the Peace Region to ensure livestock receive an adequate shock from the electric fence containing them. Ground rods are required when soil moisture is inadequate to conduct electricity. The recommendation for this grounding system is to place a minimum of three galvanized steel rods (6-8 feet by 1/2 inch) into the ground at least 10 feet apart. These rods should all be connected in sequence together and then to the fencer with 12.5 gauge insulated wire. The drier the soil the more rods that may be required.



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How to Test if Your Ground is Adequate

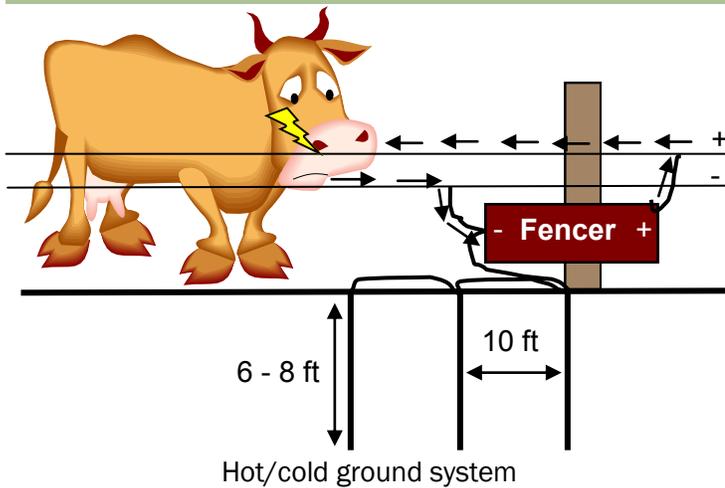
Lay enough metal “t” posts against the fence (ensure good contact with the soil) so that a voltmeter reads less than 1000V. Make sure these are 100 yards from the ground rods. Go to the ground rod that is the farthest from the energizer. Connect one end of the voltmeter to this rod

and the other deep into the soil. If the voltmeter reads over 300V then there could be one of three problems with the fence grounding:

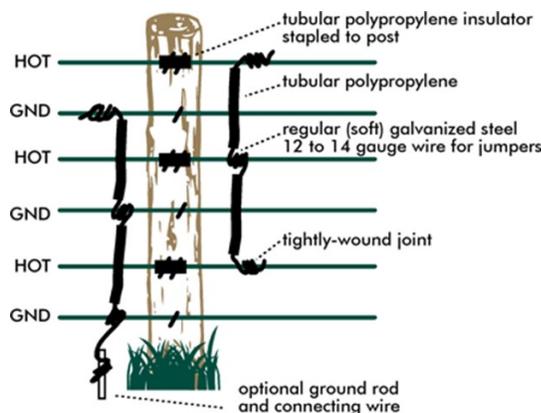
1. Not enough ground rods,
2. Ground rods too close together,
3. Connections between the ground rods and wires are poor.

Peace River Forage Association
of British Columbia





Hot/cold ground system



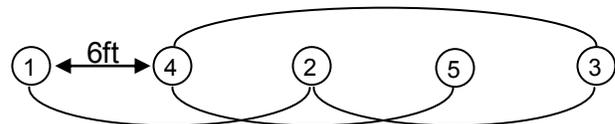
Connecting multiple hot & ground wires

Hot/Cold Ground System

When soil moisture is lacking, an earth grounding system is less effective, as it is a poor conductor of electricity. A similar situation occurs in deep snow fall areas, as livestock and/or wildlife do not have contact with the soil, and therefore do not receive a shock from the electric fence. In these situations a hot/cold grounding system can be used to deliver a shock. In order for this system to work the animal needs to come into contact with both the “hot” wire (electricity running through it) and “cold” wire (grounded). The diagram on the left is a simple example of this system. It is common in southern BC to see fences with 14 wires of which half are “hot” and the rest “cold”. This grounding system is being experimented within the new 3D fencing project.

How to Connect Multiple Ground Wires

The diagram to the left illustrates how to connect multiple hot & cold wires together. It is called jumping when all of the hot wires and all of the cold wires are connected. The wires should be jumped together every 1/4 to 1/2 a mile. This process ensures that the current flowing through the wires is evened out. It is recommended to use 12-14 gauge wire to connect these wires and to cover the connecting wire with insulated plastic tubing so the hot wires do not short out the ground wires.



Top view of ground rods and example of how to get at least 10ft between each connection.

Ground Rod Placement & Order

Both grounding systems can use ground rods so ensuring proper placement and order is important. Insert ground rods along a fence line or beside a building to prevent tripping over the connecting wire. Try to put the ground rods in areas of permanent moisture. The drier the soil the more ground rods that will be required to keep the fence working effectively. In the hot/cold ground system it is recommended to add ground rods every 1500 - 3000ft around the fence. If it is not possible to space the rods 10ft apart then the rods can be pounded closer together and wired in a pattern. Make sure that the wire is insulated so it does not touch itself where there is overlap. See the example to the right.

Summary

Proper grounding is essential. No matter what size your fencer claims to energize it will not effectively do so if the grounding system is insufficient. Now you know the two different systems used, plus how to check if they are working correctly.

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