



Virtual workshop series: Water quality impacts of livestock operations and grazing management

Natural Resources PFT

Kansas Center for Agricultural Resources and the
Environment (KCARE)

Water quality impacts of livestock operations and grazing management

- Offered as a Professional Development Event in PEARS for county extension agents
- Date/Time: May 5 to May 13, 8:30 am to 9:30 am
- **Zoom Meeting ID: 952 6066 1935**

Today's format

- If you haven't already, **please mute** your microphones.
- Speakers will present for 30-40 minutes
- Panelists will join the discussion at the end
- Please ask questions through the **chat** function (located at the lower part of your screen).
- Although our “end time” is posted for 9:30 a.m., participants are welcome to remain longer if they want to discuss the topic further.



Water quality impacts of livestock operations and grazing management

Electric fence systems

Wednesday, May 13

Speaker



Rod Schaub

Frontier Extension
District Agent

Panelists

Will Boyer, KCARE watershed specialist; **Herschel George**, KCARE watershed specialist, retired



Fencing Systems



Rod Schaub
Frontier Extension District
Livestock Agent

What Is the Right Fence?

- Any fence that keeps livestock where you want them.



What Fences Are Appropriate For Grazing Systems?

Physical Barrier



What Types Are Appropriate For Grazing Systems?

Psychological
Barrier: Electric
or Power Fence



Temporary



Permanent



Electric Fencing

- Cons
 - Bad experiences
 - Most misunderstood
 - Least familiar
- Pros
 - Least expensive
 - Durable
 - Easy to install
 - Most Flexible

Components

- Charger
- Fence
- Ground



Charger or Energizer

- Low impedance
 - minimum 5000 volt output **with a load**
 - pulse <300 mAmp 0.0003 seconds long
 - 35 - 65 pulses per minute
- Size - miles, acres, joules
- 110 volt, Battery or Solar
- Surge protection
- Lightning choke or induction coil
- Snap in service modules
- 1 joule per mile of fence under an average load
 - Joule = one watt for one second.
 - It is the measure of the “horsepower” of a pulse



Electric Energizer

protected from weather and with a surge protector installed



Solar Energizer

Large solar panel



Solar Energizer

Small panels on chargers are inadequate



Battery type charger attached to barbed wire



Ground

90 % of electric fence problems are from poor grounding system.



Fence Charger Grounding System

- 3 feet of 1/2-5/8 " rod per joule
 - **Minimum 3 six foot rods**
- Spaced 10' apart, in moist area
- Use galvanized ground rod, clamp, wire
- **Avoid mixing metals**, such as copper and galvanized. Causes corrosion and poor conduction.
- 65 ft from utility ground, well casing or other grounds
- Keep ground rod ends, connecting wire and clamps above ground

Install charger ground rods under fence lines or drip edge of a building.



Install Ground Rod Connectors Above Ground Level



Not Deep Enough!

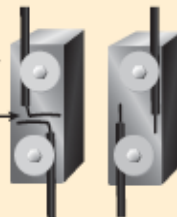


Drawing 1 Energizer Installation

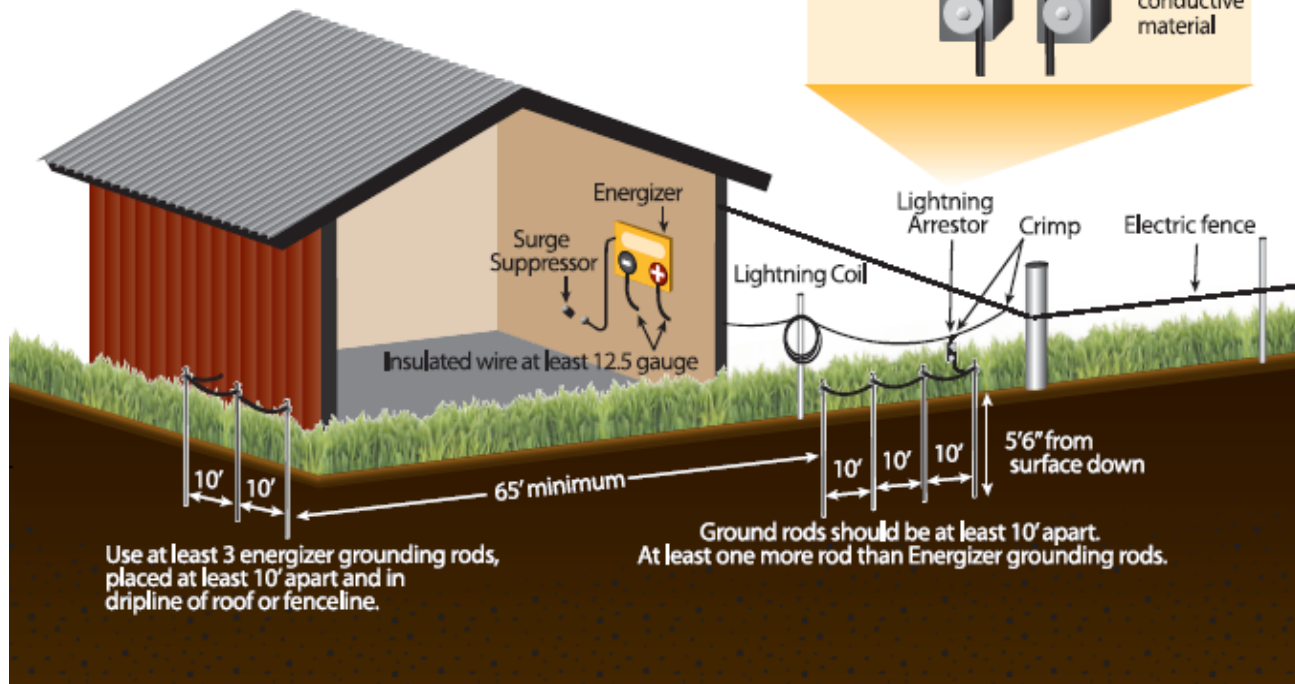
Simple Lightning Arrestors

(can use either)

Gap wires sufficiently to prevent arcing



← Plastic or other non-conductive material



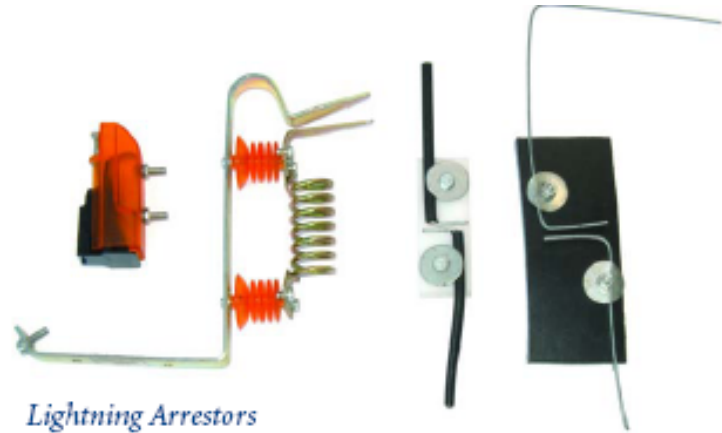
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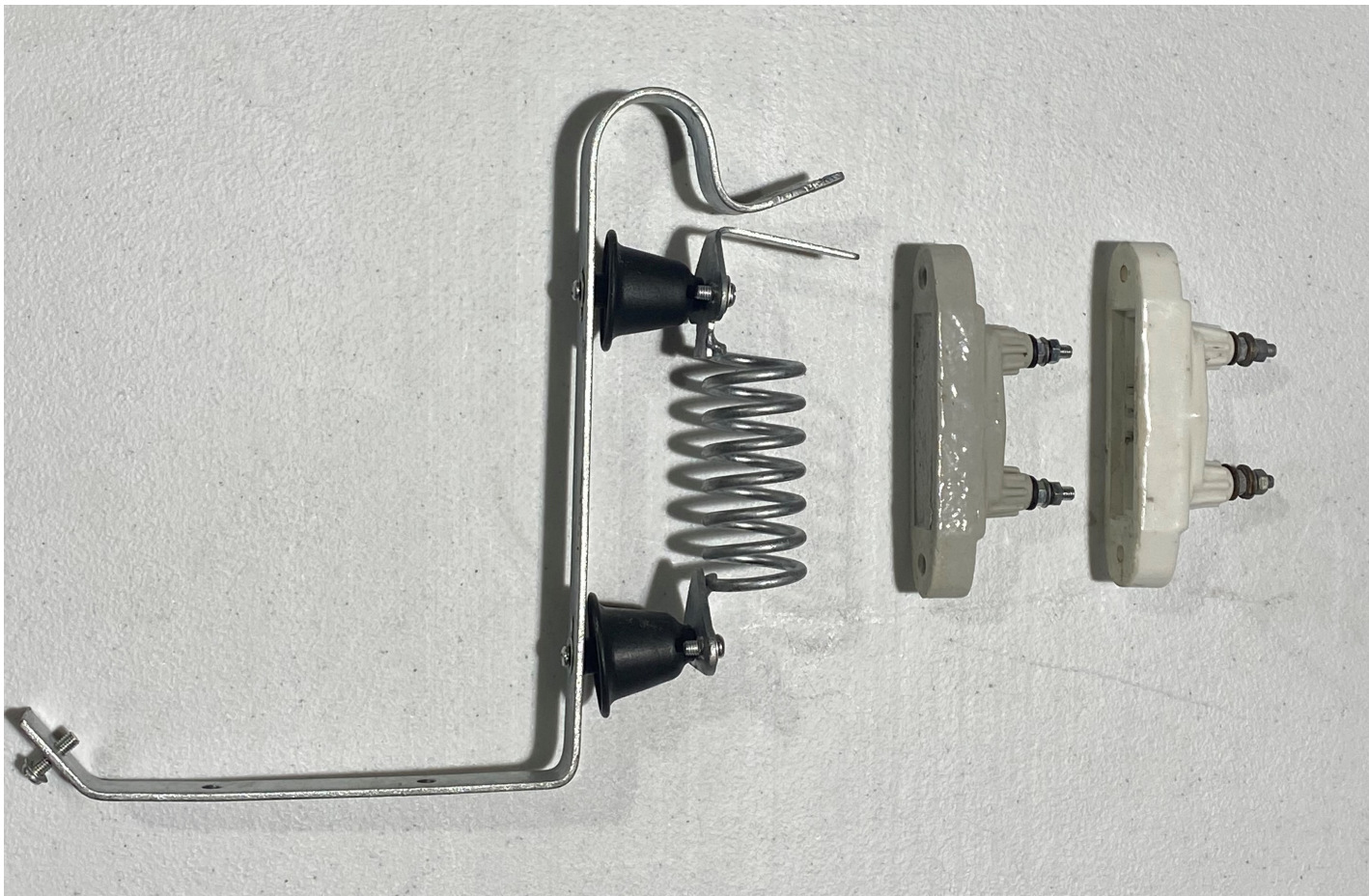
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Lightning Protection

- Minimum 65 ft. from charger ground rods
- One more rod than charger ground
- Want to attract the lightning to this point
- Lightning Arrestor
 - Purchased or home-made arrestor
- Lightning choke
 - Purchased or home-made arrestor



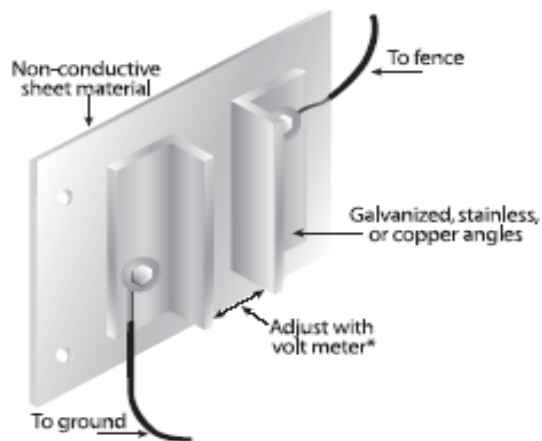
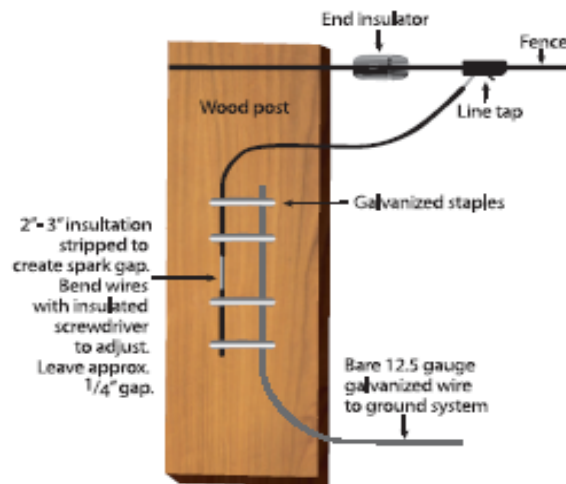
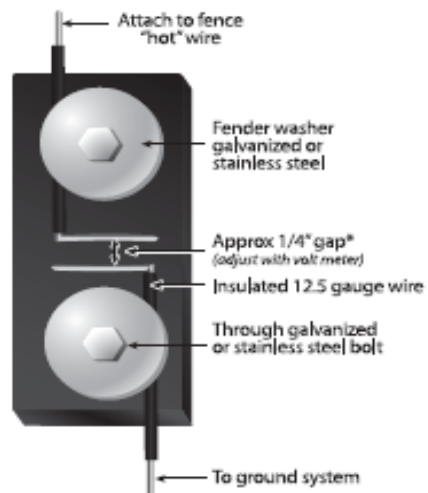
Lightning Arrestors



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Drawing 6 Home-Built Lightning Arrestors

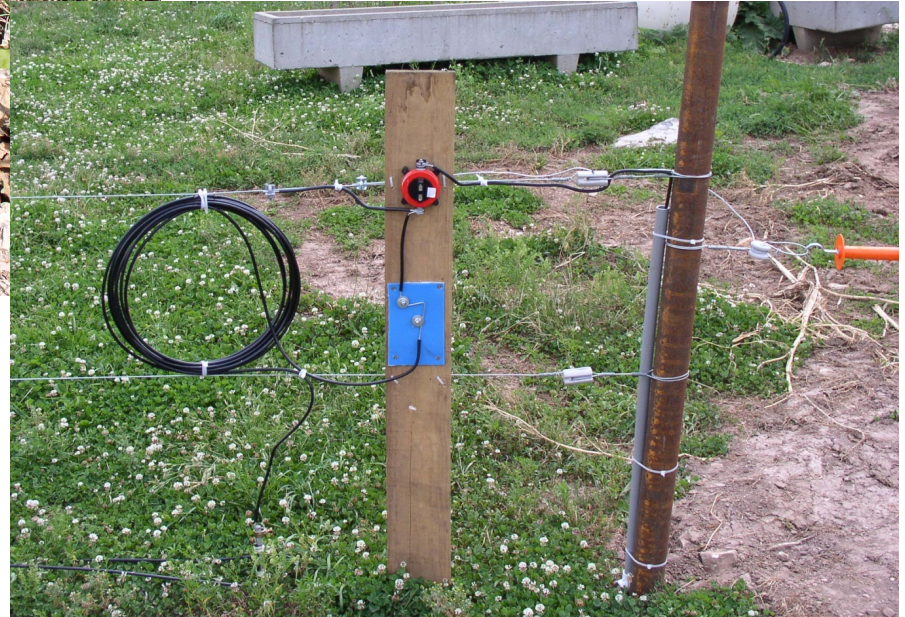


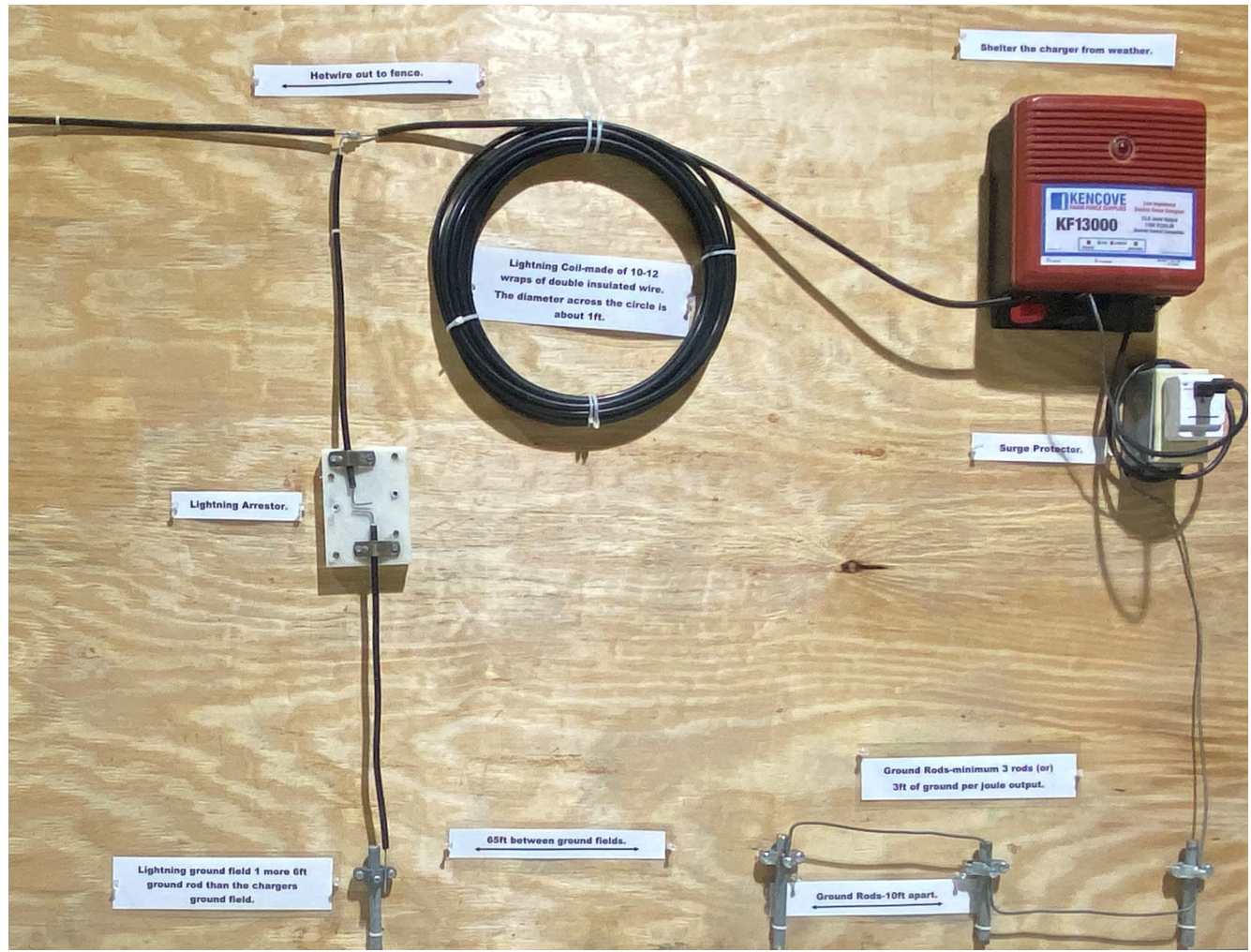
*Adjusting Gap with a Volt Meter

1. Set energizer to highest setting.
2. Secure lead from fence.
3. Leave lead to ground loose enough to slide.
4. Leaving lead to ground unattached at grounding end, clip volt meter to ground system then to end of lead.
5. Slide lead at arrestor apart until voltage is no longer read on volt meter.
6. Tighten lead on arrestor and then secure to grounding system (after removing volt meter).

Another method is to slide leads apart until arcing no longer occurs, then check with volt meter.

Lightning Choke

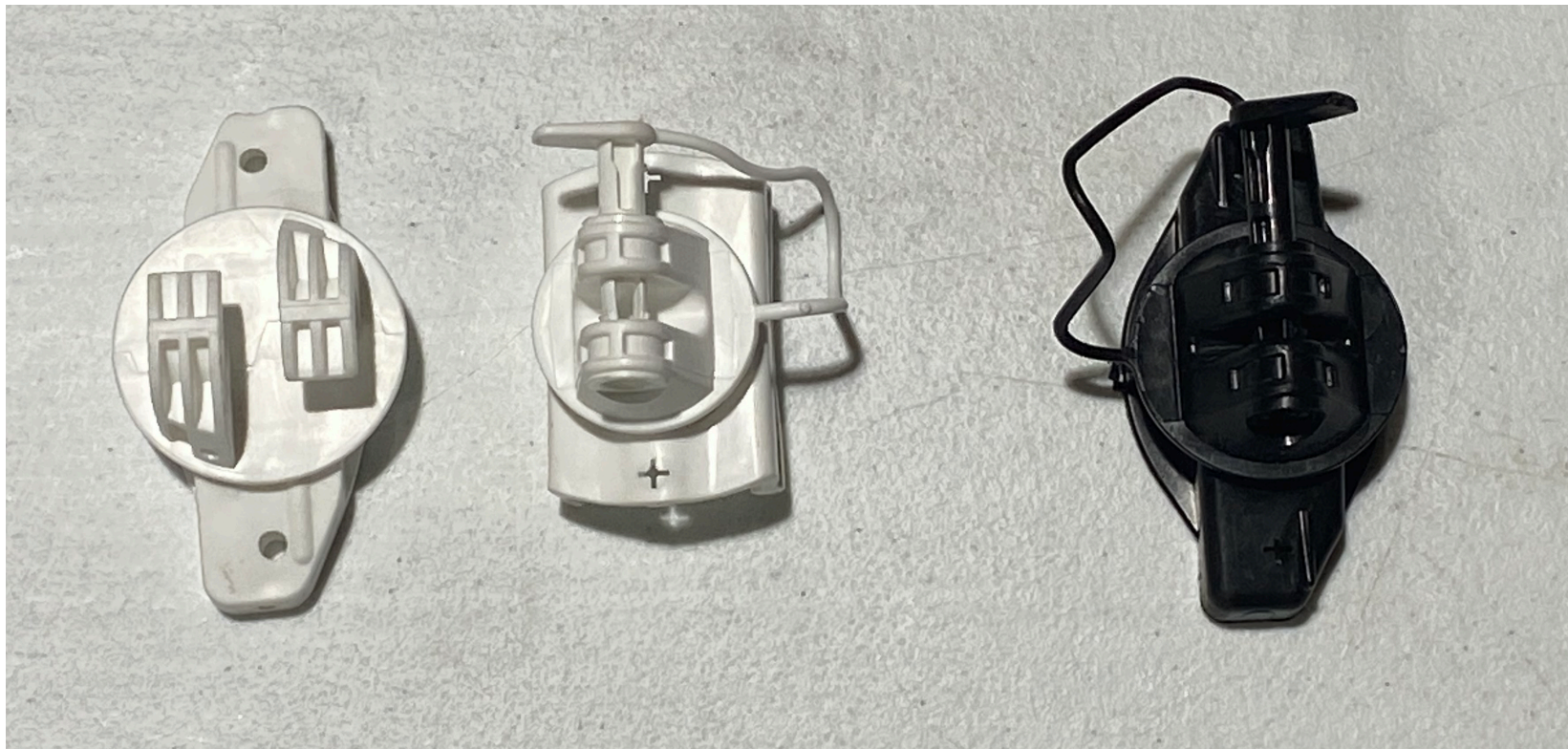




Permanent Fencing

- Use 12 ½ gauge high tensile wire
- Make sure wire is class 3 galvanized
- Wire strength 170000 psi to 210000 psi
 - Wire under 200000 psi is easiest to hand tie
- Place posts 40-50 feet apart on level ground
- Insulators- purchase with 10 year warranty-UV protection
- Pin lock versus claw type – pin lock much easier to attach high tensile wire





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Offset bracket on existing fence



Portable Fencing

- Polywire – Braided versus Twisted
- Polywire comes with 6 strands of SS, 9 strands of SS, or mixed metals.
 - Mixed metals are more conductive, but the stainless steel strands won't break as easily
- Reels – Geared vs. Standard
 - Geared reels will make work much easier/faster.

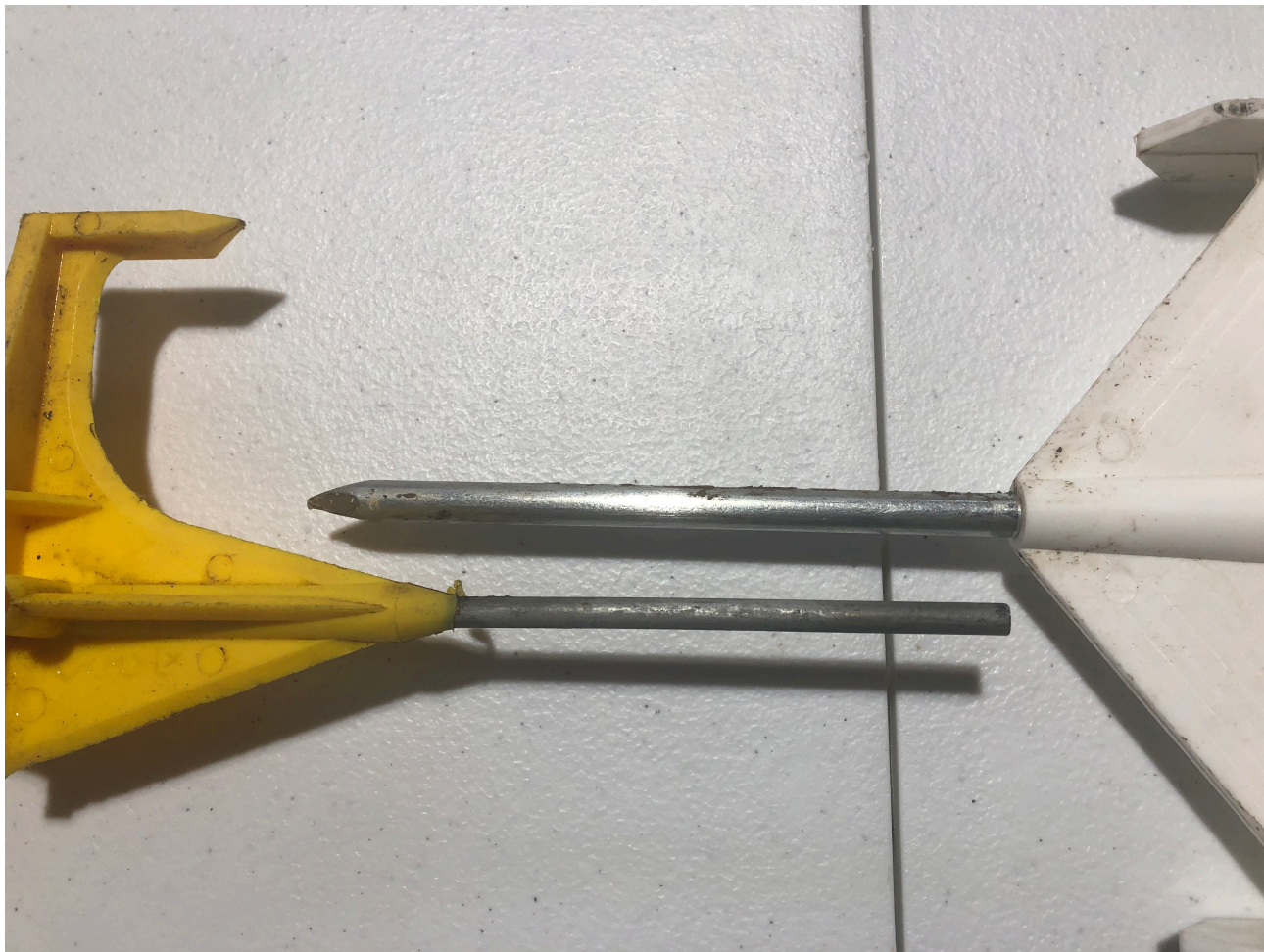
Portable Fencing

- Many kinds of posts can be used in portable systems
 - Pigtail, fiberglass, stirrup, and step-in posts
- Choose a post according to ease of use
- A post with a large step and a small diameter rod is easiest to get into the ground



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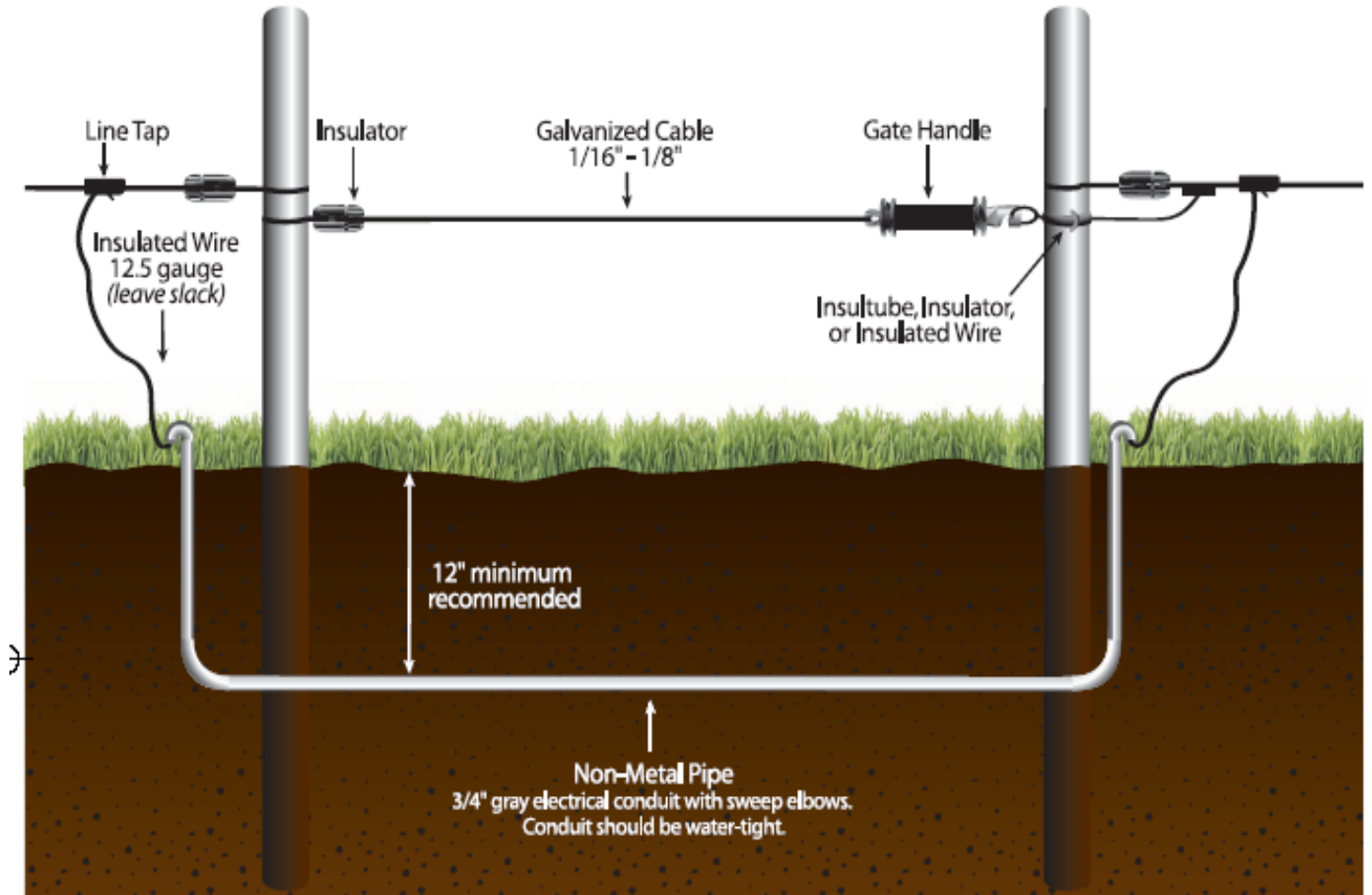
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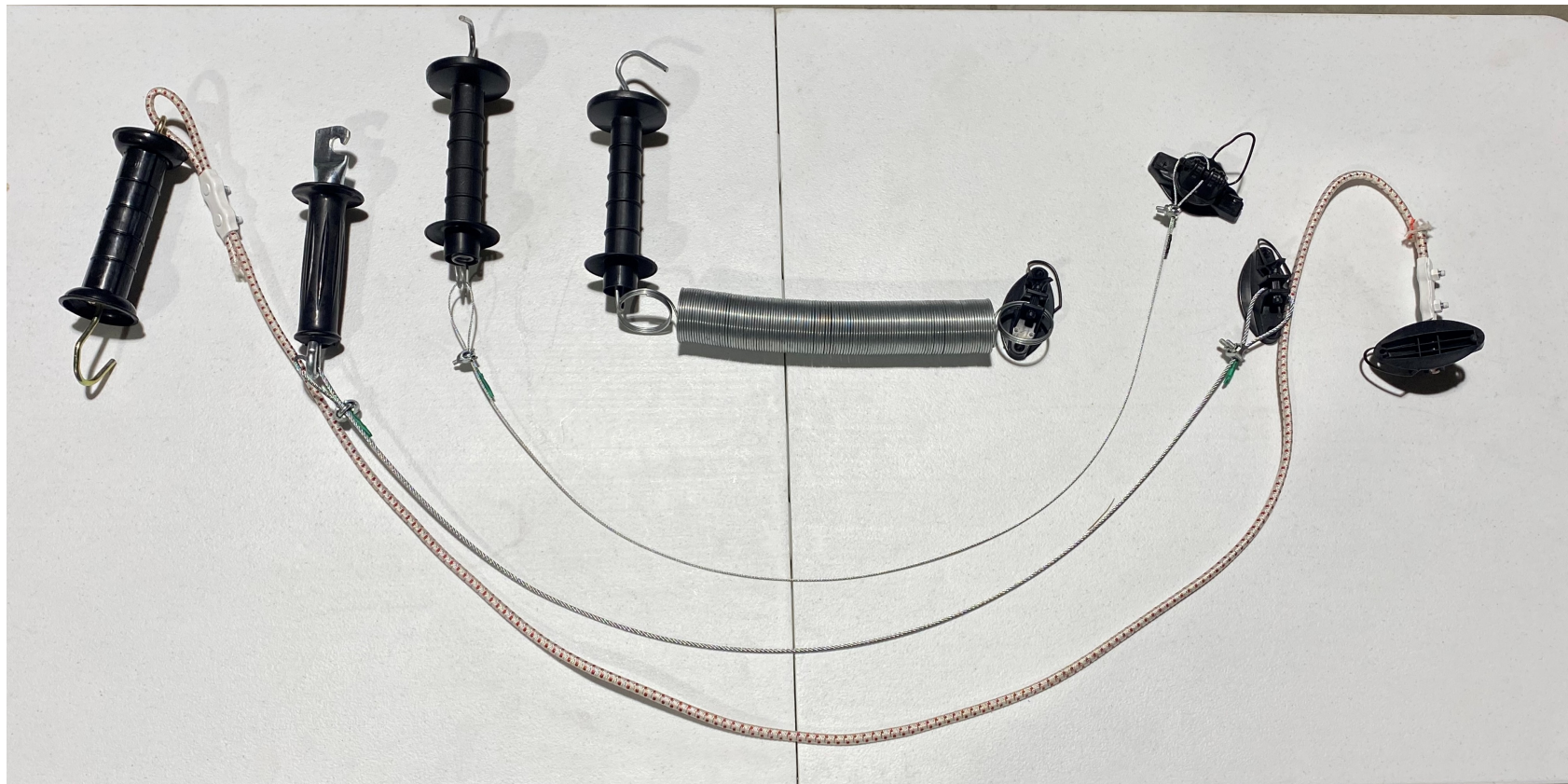
Drawing 7
Electric Gate (not hot when unhooked)





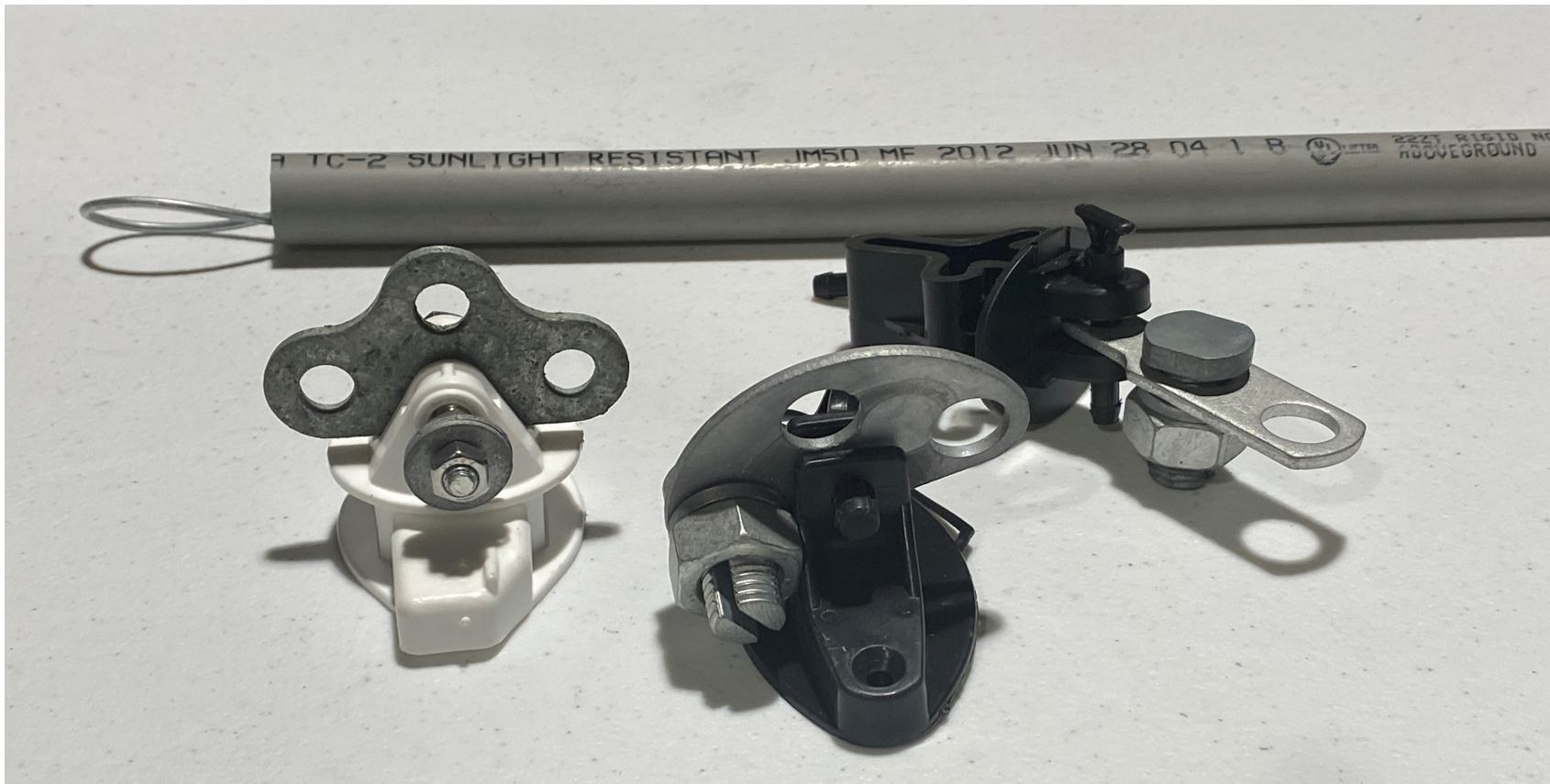
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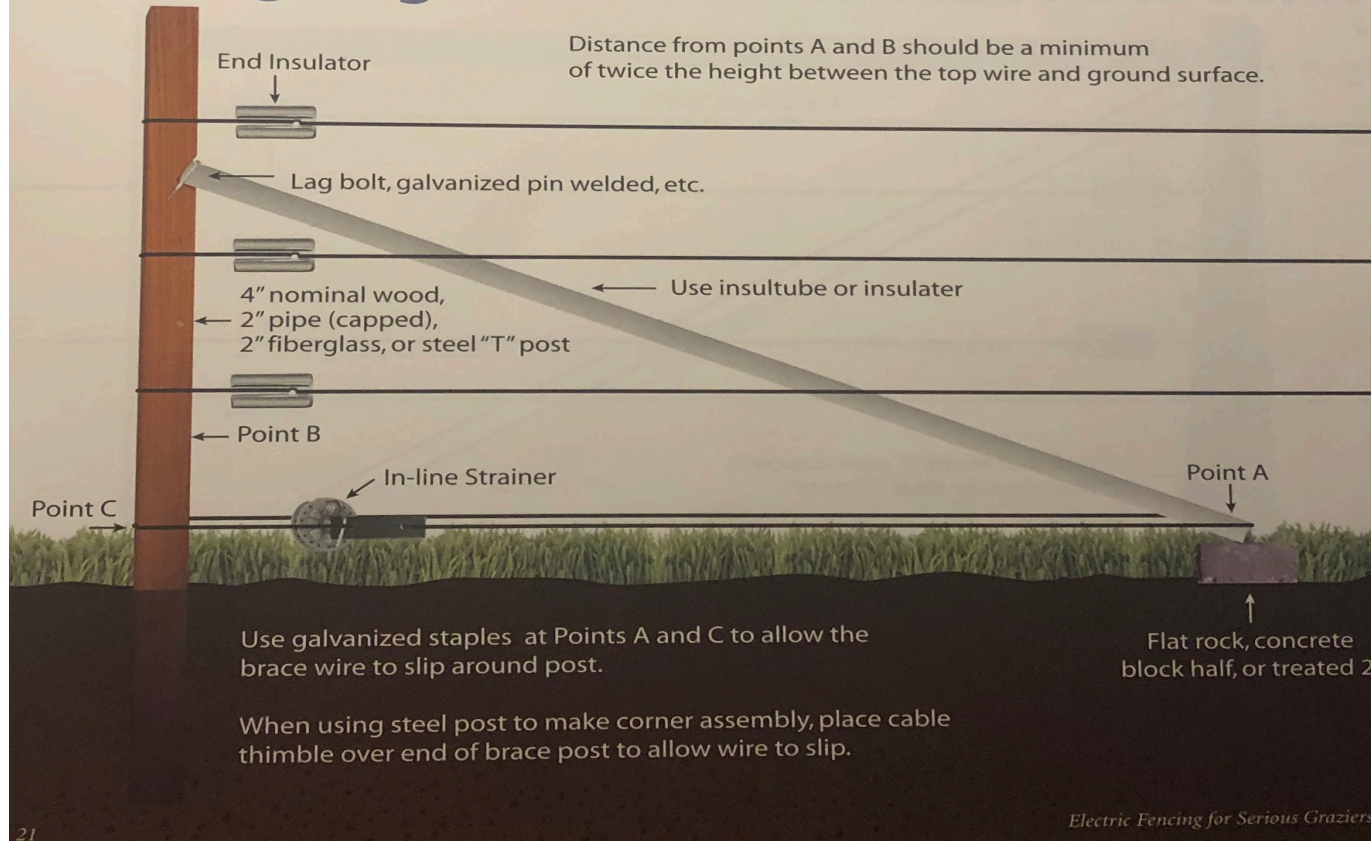
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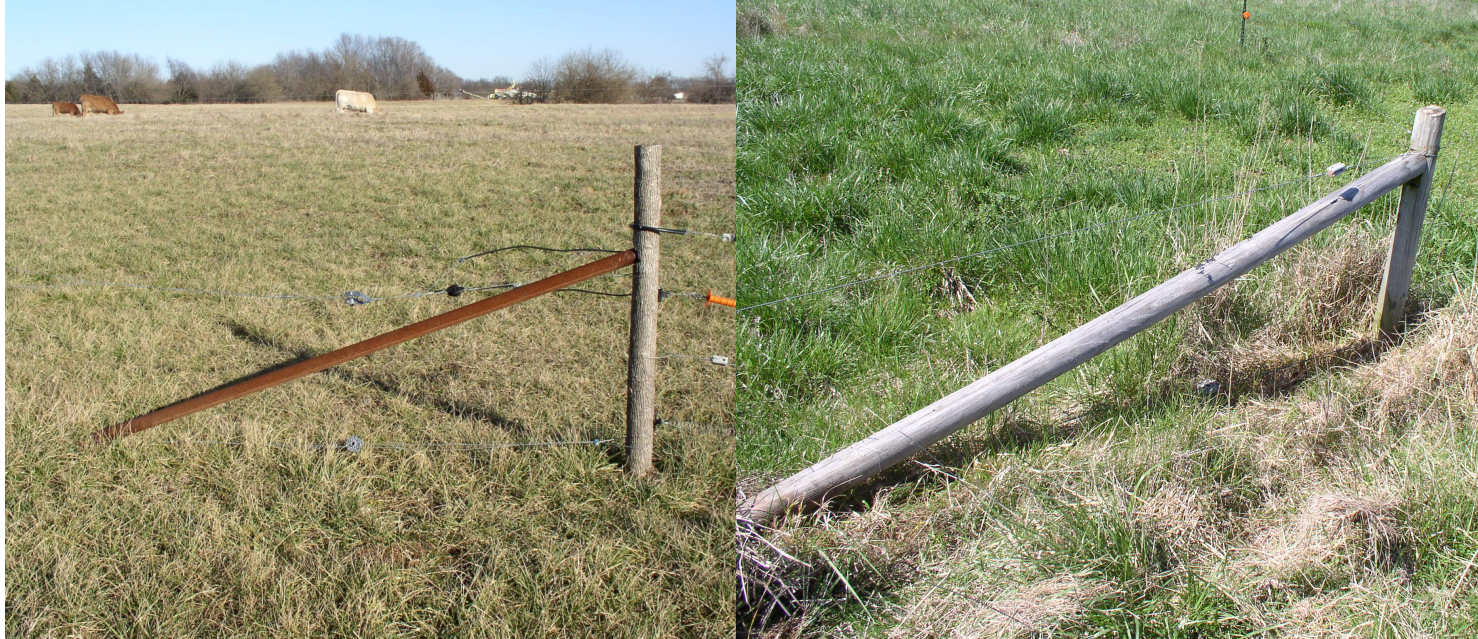
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Drawing 8a Floating Angle Brace



Floating Angle Brace

Effective for 1 to 8 wire fences



**Steel T-post floating
angle brace
Effective on 1 to 2
wire**



**Steel Pipe, minimum 3"
diameter, driven as deep as
amount of post above ground
Effective on 1 to 3 wires**

Summary

- Look around: learn from others' experience
- Find a reputable dealer who knows their products and will stand behind them
- Practice
 - Get your feet wet (but don't touch the fence with wet feet!)
- Don't cut corners

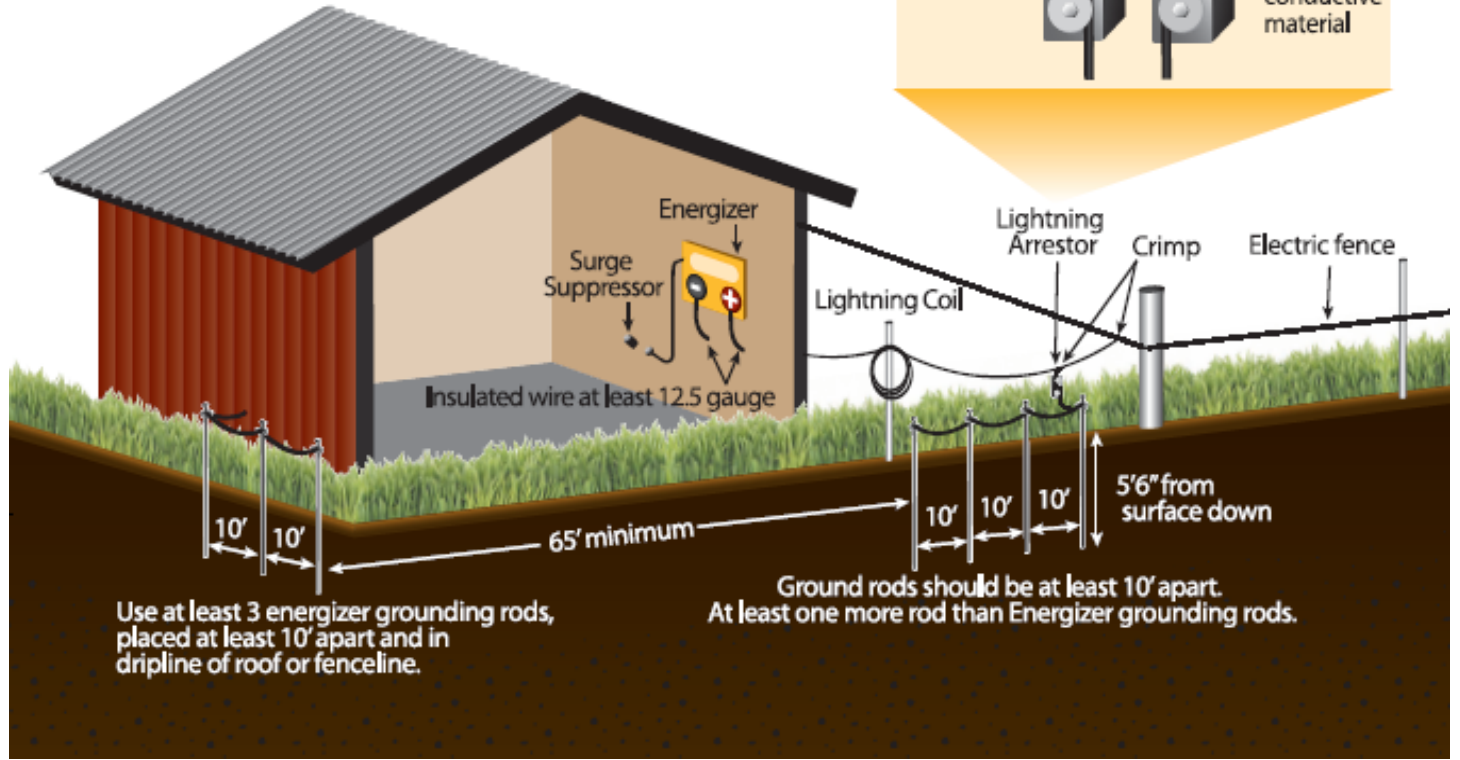
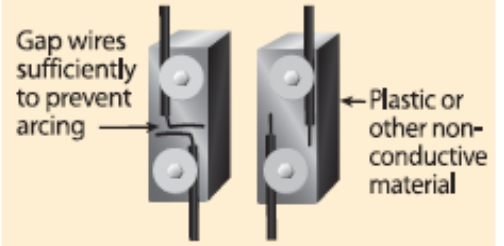


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Drawing 1 Energizer Installation

Simple Lightning Arrestors (can use either)

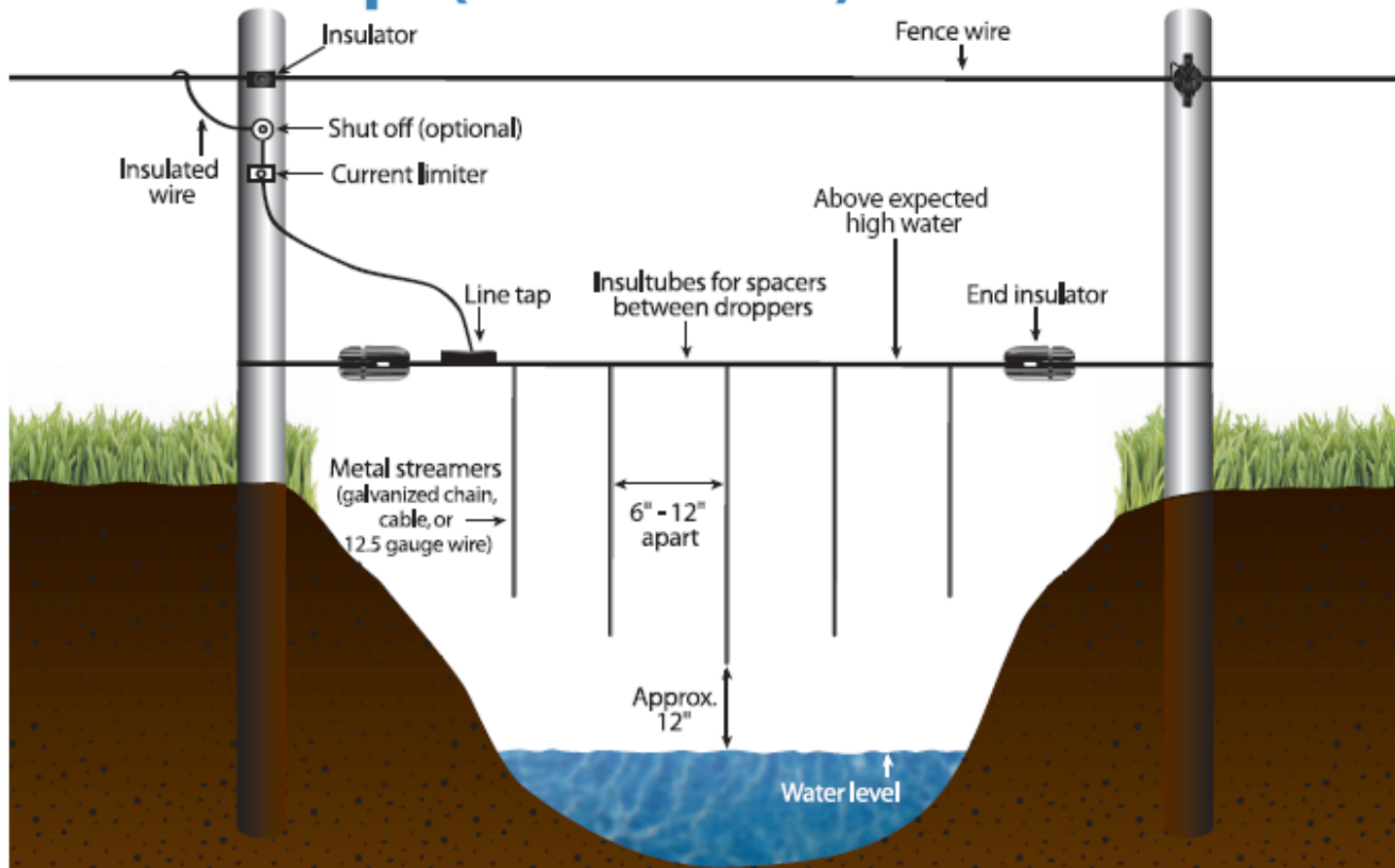


Don't hook insulators directly to trees.



Drawing 9

Water Gaps (Flood Gates)



Electric Water Gap



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Electric Energizer

Protected from weather elements and has a surge protector installed



