

Electric fencing for livestock

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Key messages

- + Electric fencing allows stocking density to be adjusted so that grazing pressure can be controlled
- + Electric fencing is a crucial part of systems that include rotational grazing, whereby animals move around the farm in an ordered and logical way
- + Electric fencing can also be used to preclude livestock from areas that may prove dangerous or unhealthy
- + Forward planning is essential to save time and energy when it comes to erecting the electric fence
- + There are three types of electric fencing – permanent electric, off conventional and temporary electric. The purchase and erection costs of electric fencing vary significantly
- + A good electric fence system requires a combination of components that all work efficiently in tandem, including an energiser, a power source, an earth system and a conductor
- + Electric fencing requires a change in thinking compared to conventional fencing
- + Training stock can save significant time and hassle when it actually comes to putting them into fields or paddocks bounded by electric fencing

Keywords:

Permanent electric fencing, temporary electric fencing, electric fencing for cattle, electric fencing for sheep

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Introduction

Fencing is a crucial element of managed grazing, as it provides the ability to control where the livestock eat and how long they remain there.

Fencing can be one of the most expensive elements of what is generally a low-cost farming system. However, the type of fence used has a significant impact on the cost per metre, as well as the on-going maintenance costs.

Electric fencing can be cost-effective and flexible. Whilst it does not suit every farm or system, it is worth considering either as an alternative to conventional fencing, or a tool to use alongside it.

Providing it is well set-up and maintained, electric fencing can be very durable, as there is very little, if any, physical contact with the fence line.

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Why use electric fencing?

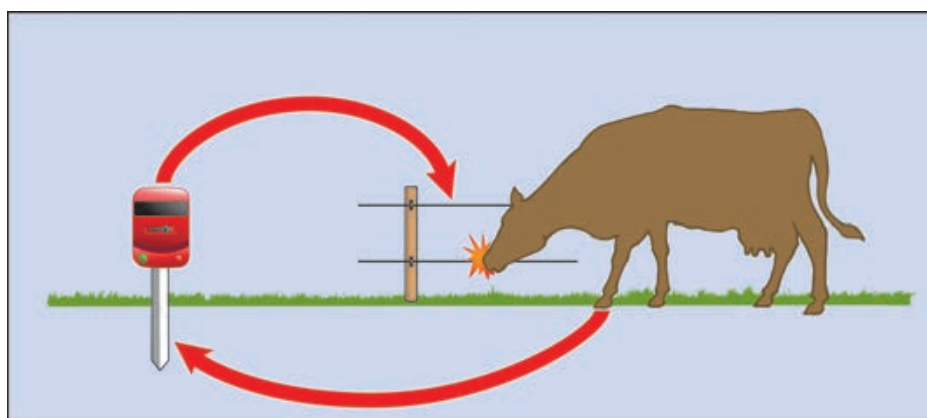
Temporary electric fencing allows stocking density, ie the number of animals grazing per hectare, to be adjusted so that grazing pressure can be controlled.

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This is very important when managing grass for maximum utilisation and feed growth/quality. It allows producers to accurately allocate areas to be grazed, based on the number of animals and their feed demand.

An electric fence is designed as a psychological barrier to keep stock in or out of a particular area. A pulse of electric current is sent along the fence line from a ground energiser. When an animal makes contact with the fence, the circuit between the ground and the fence line is completed, sending a short, sharp but safe shock. This should be sufficient that the animal remembers it, but will not cause it any long-term harm.

Figure 1: How an electric fence works



Electric fencing is a crucial part of systems that include rotational grazing, whereby animals move around the farm in an ordered and logical way.

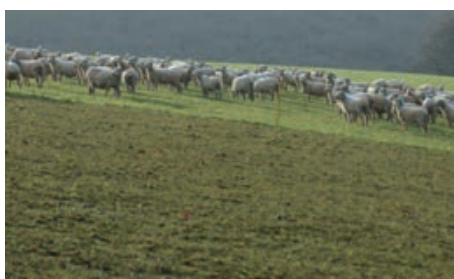
Electric fencing is a crucial part of systems that include rotational grazing, whereby animals move around the farm in an ordered and logical way, returning to each particular area once the pasture has recovered and regrown after the previous grazing. This could be anything from 21 days to 120 days, depending on the system, crop and time of year.

Electric fencing can also be used to preclude livestock from areas that may prove dangerous or unhealthy.

All grass wintering (AGW) of ewes and group grazing of cattle or sheep on herbal leys, are examples of managed grazing systems that rely heavily on electric fencing.

For more information on AGW see **All grass wintering of sheep BRP+** at beefandlamb.ahdb.org.uk.

Electric fencing can also be used to preclude livestock from areas that may prove dangerous or unhealthy, such as eroding riverbanks or wet areas where the mud snail, the intermediate host of liver fluke, may be present. These areas may change in size from season to season.



All Grass Wintering of ewes relies on electric fencing

Forward planning is essential to save time and energy when it comes to erecting the electric fence out in the field.



Forward planning saves time when it comes to erecting electric fences

Planning

Forward planning is essential to save time and energy when it comes to erecting the electric fence out in the field.

- + What type of fence is needed?
 - Permanent, semi-permanent, temporary or to protect an existing fence or hedge
- + What livestock are to be contained?
 - This will alter the wire height and post spacings
- + What length or area is to be fenced?
 - An accurate assessment of the area to be fenced off will indicate how many posts, the length of wire and energiser power output required
- + How many corners and changes in direction are there?
 - Stronger posts are required at corners and any significant bends in the fence
- + Are there any gateways?
 - Think about stock movement in and out of the fields before constructing the fence
- + Can mains power be accessed or will a battery or dual-power unit be needed?
 - The power output of the energiser required will vary depending on the length of the fence or type of stock. Sheep fencing needs greater power

Types of electric fencing

There are three types of electric fencing – permanent electric, off conventional and temporary electric.

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Permanent electric

Permanent electric fencing is a long-term option, which once established should be trouble-free for many years.

It combines permanent wooden, metal or fibreglass posts with high tensile steel wire.

Requirements

- + Energiser
- + Earth stakes
- + Wooden, metal or fibreglass posts
- + Post insulators
- + End strain insulators
- + Joint clamps
- + Electrified gates
- + Wire tensioners
- + Wire



Fence wire tensioner

Off conventional

Off conventional fencing consists of an electric fence wire placed at a small distance from an existing timber or wire mesh fence.

This prevents stock from rubbing or pushing against the original fence line to extend its working life. This system can also be a cost-effective way to feed an electric current around a farm to more distant locations.



Wire fence with plastic insulators

Requirements

- + Energiser
- + Earth stakes
- + End strain insulators
- + Line post insulators
- + Wire tensioners
- + Wire
- + Offset brackets

Temporary electric fencing

Temporary electric fencing is designed to be lightweight and easily transported. It allows large fields to be broken up for 'strip' or 'paddock' grazing. With the help of mechanisation, such as specially adapted quad bikes, these can be moved and re-erected very quickly.



Temporary electric fencing

Requirements

- + Energiser
- + Earth stakes
- + Reel and reel post
- + Polytape, polywire, polybraids/polyrope or steel wire
 - Polytapes have high visibility but can weaken in the wind, leading to greater maintenance cost
 - Polywires are the cheapest option. As they are lightweight, less posts are needed to maintain optimum wire height. However, they have a higher electrical resistance due to having smaller wire diameter
 - Polybraids/polyrope offer good visibility and wind resistance but are the most expensive option
 - Steel wire has the lowest resistance which minimises voltage drop over long fences, but is heavy and requires closer post spacing to maintain wire height
- + Portable fencing posts, including some anchor posts
 - Some plastic posts can become brittle in sunlight and do not last long. UV-protected posts are better
- + Insulators

The purchase and erection costs of electric fencing vary significantly.

Cost

The purchase and erection costs of electric fencing vary significantly.

- + A typical three-line electric fence for sheep or cattle will cost between 40-60p per metre
- + Installation time is typically 30 minutes to one hour to erect and pick up a 600m three-line system. With labour at £15/hour, the cost to move and re-erect a fence is estimated to be about 1.25p to 2.5p per metre
- + Electric fencing can be 50% cheaper to build and maintain than traditional fencing with barbed wire, according to work carried out at Iowa State University in 2005

See Appendix 1 for more detailed costings of different fencing options.

Components of an electric fence

A good electric fence system requires a combination of components that all work efficiently in tandem, including an energiser, a power source, an earth system and a conductor.



The energiser is the powerhouse of the electric fence

Energiser

The energiser is the 'powerhouse' of an electric fence system. There is a choice of power output, pulse frequency and voltage density.

The energiser converts the mains or battery power into high voltage pulses of current, which are regularly sent down the wire, generally every couple of seconds. The type required depends on how close the fence is to a mains supply, the length of fence and type of stock to be contained.

Energisers are power-rated in joules, which is expressed as either 'stored energy' or 'energy output'. It is best to look at the stored energy rating, as this remains constant. While it is affected by fence-length, it is not affected by external conditions that may affect the pulse, such as poor earth grounding. The electricity must complete a full circle back to the charger through the ground.

Voltage is derived from the potential power output of the unit, but is also dependant on the power supply to it and the efficiency of the earth system (see page 8).

In some situations power requirement guidelines may seem excessive. However it is important to ensure sufficient power is provided so that the fence remains effective when faults occur, such as when grass touches the wire. This also ensures livestock can detect the electrical field around the wire before contact is actually made.

- + Aim for a consistent output to contain either cattle or sheep
- + Calves or untrained cattle require 4,500V-5,500V
- + It is possible to use 3,500V-4,500V for trained cattle
- + For sheep it depends on the amount of wool present, but generally +5,000V to train them (4,000V if shorn), reducing to 3,000V-4,000V once they are used to it
- + Setting energisers up in the middle of an electric fence system will reduce the risk of low voltage at the furthest points

One joule of stored power should be enough to power 5-6 miles of 2.5mm diameter high tensile wire, or 1 mile of polywire at 4,500V. Power requirement increases dramatically the more vegetation load is placed on the fence.

A lightning diverter will help protect the energiser if lightning strikes, preventing severe damage.

Power source

Mains

Running an energiser on mains power is usually the best choice where possible, as it is cheaper than batteries and does not entail changing units. However a suitable underground cable is required to connect a mains power energiser to the fence and earth posts. This can be expensive if runs over long distances.

Pros	Cons
Cheap to run	Can prove expensive to set-up
No batteries to change	Not suited to areas with public access
Only dependant on energiser for voltage	

If considering mains electricity, professional advice is essential and all risks and hazards must be considered.

Battery

Battery-powered energisers clip directly on to the fence and earth post, these can vary in power output. Avoiding temperature fluctuations will prolong a battery's lifespan, so keeping the battery in an old cooler box can increase its life.

Always use a leisure or marine battery, as these are designed to cope with deep discharge/recharge cycles and will give significantly greater life than automotive types.

Pros	Cons
Better suited to temporary fencing	Greater running costs
Portable	Batteries need replacing
Can be cheaper to set-up	

Solar

Solar panels generate power by converting sunlight into electricity, which is then stored in a battery. They should be fitted with a regulator to ensure the battery is not damaged by excessive amounts of power generated on hot sunny days.

The battery type and capacity (amp hours) should be selected carefully to complement the solar panel unit. The battery should also contain enough capacity to reliably power the energiser during winter or in reduced light conditions. Consider a deep cycle (leisure or marine) battery.

Solar-powered units offer an alternative power source in more remote locations. Ensure the solar panel is in optimum position and angle to convert sunlight to electricity. Follow manufacturer's instructions.

Pros	Cons
Running costs can be cheaper than conventional batteries	More expensive than battery-only systems
No requirement to remember replacement batteries	Influenced by weather and season



An earthing post

Earth system

The earth system is as important as the layout of the whole fence, as it allows the power to flow around the fence. However, this important component is often overlooked.

An electric fence is an open circuit. If the earth system is efficient, when an animal touches the wire it will produce a shock and then allow the flow of electricity back to the energiser.

The depth of the earth rod in the ground is dependent on its conductivity/surface area and the moisture of the soil. Small diameter rods in dry soils need to go deeper than larger diameter rods in wet ground.

In UK conditions, a 16mm copper-coated steel rod generally needs to be at a depth of 30-40cm/joule of energy, but may need to go deeper depending on how dry the soil is.

For any electric fence to work correctly it needs an earth stake in the ground attached to the energiser. This ensures the power returns through the ground to the energiser.

For larger systems, (eg ones using a five joule energiser) two metres of earth is required. The stakes should be at least four metres apart and linked with underground cable, which is connected to the energiser's earth terminal. Ideally the earth stakes should be in a damp site.

To test the earth system, short the fence by placing an iron bar across the wire to the ground at least 100m from the earth system. A tester should indicate a figure near zero; anything reading above 200V needs more earth stakes.

An alternative approach is to dig a trench at least one metre deep and bury a copperbond or stainless steel rod of appropriate length. This ensures consistent contact with damp soil, over the entire rod length. Depending on soil type and site the requirement is roughly 25cm of earthing rod length per joule of energiser power output.

It may be appropriate to treat the grass under the fence line to stop contact with the wire however, this is only practical if it is a permanent fence or lines where temporary fence is regularly erected.



Steel wire and plastic insulator

Conductor

Electric fencing can use different types of wire or conductor to conduct the electricity along the fence line.

- + Steel wire (single or multi-strand) is strong, durable and effective at conducting electricity, but is heavier than other alternatives. This type is best used in permanent and semi-permanent fencing

The steel wire should be high tensile not mild steel, as this has minimal length change with temperature, which ensures consistent fence tension and wire height. 2.5mm diameter wire should be used when power needs to be supplied over a long distance (>6 miles); 1.6mm diameter wire can be used over shorter distances (<6 miles) as it is lighter. This means post spacing can be extended reducing the cost.

- + Polywire is a polythene twine with interwoven filaments of stainless steel wire. This is lighter and more commonly used in temporary fencing systems, but can also be used in permanent fencing

- + Polytape and polybraid contain steel wires inside polythene in a ribbon. These come in different widths and colours and are often easier to see, but can be prone to damage in high winds. Can be used for permanent and temporary fencing

- + Electrified netting is available in a range of mesh sizes for different types of stock. This type is most suitable for temporary or strip grazing with young lambs/calves, or as a training aid



Polytape on the top of a fence



Reels

A reel allows the fence wire (conductor) to be unrolled quickly and evenly without kinks and rolled up again for re-use in a convenient way for temporary fencing.

A reel post allows the fence wires to be independently tensioned. By fixing a reel to a post it also keeps the wire fence taut. There is a wide range of different reels available to suit different systems.

Geared reels significantly reduce the time it takes to dismantle a fence.

Posts and stakes

Permanent electric fences commonly use wooden posts with insulators attached to them. Temporary fences use metal, fibreglass or plastic stakes. The latter two types have the advantage of being insulating, which can be easier to handle and will not short out the fence if they contact a live wire.

Sometimes polywire or multi-strand steel wire can fray. If these make contact with the metal posts it can cause the fence to short.

Fences require stronger anchor posts at the end and corners to help take the strain. Posts and stakes are available in different heights and wire spacings.

For temporary fencing that is being moved frequently, place posts at regular intervals – the less posts the better, depending on the class of stock being enclosed. For sheep and calves 12-20 metre intervals are good and for cattle 15-25 metres intervals should work fine.

Electric fencing requires a change in thinking compared to conventional fencing.

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Plastic post

For a conventional fence, the security of the fence is in direct proportion to the physical strength of the posts and wire, as the animals are able to challenge them directly by rubbing or scratching.

With an electric fence, the security is in proportion to the voltage and consistency of the wire height. Once an animal is trained, it will not challenge the fence providing the wires are at the correct height.

Therefore posts must be spaced to maintain wire at the optimum height. This can mean spacing of up to 25 metres on flat ground, but can sometimes be as little as four metres on undulating ground.



Insulator

Insulators

Insulators are used to prevent the conductor or wire touching the posts or stakes, which could lead to power leakage. Special anchor insulators are used at the end of fence lines or around corners.

The insulators should be smooth and dry easily so moisture does not collect, as this can cause arching, which reduces the effectiveness of the electric fence.

Fence tester

All fences should be tested regularly to measure the power running through the fence lines. Some fence testers can also identify where faults are occurring.

Fencing for different classes of livestock

Livestock type will influence the selection of fencing, in terms of the distance between posts and the number of wires required.

Cattle

Cattle are very sensitive to electric fences, so a single strand of wire 90cm off the ground is all that is needed. However, if both cows and calves are being grazed, two strands are required (Figure 2).

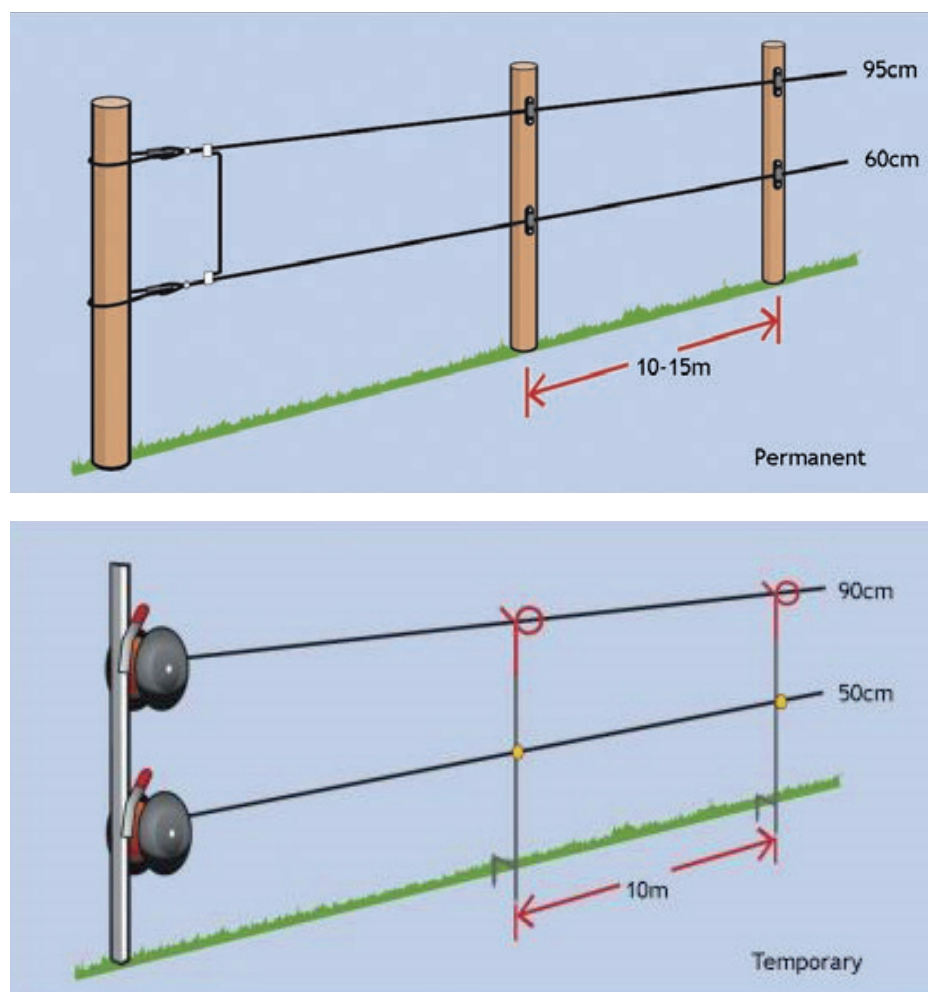
Calves can be creep-grazed on to better quality pasture using a creep gate.

If using more than one strand of wire, ensure the live wire, which is connected directly to the power source, is at nose height.



Fence tester

Figure 2: Ideal wire heights for permanent and temporary fences for cows with calves





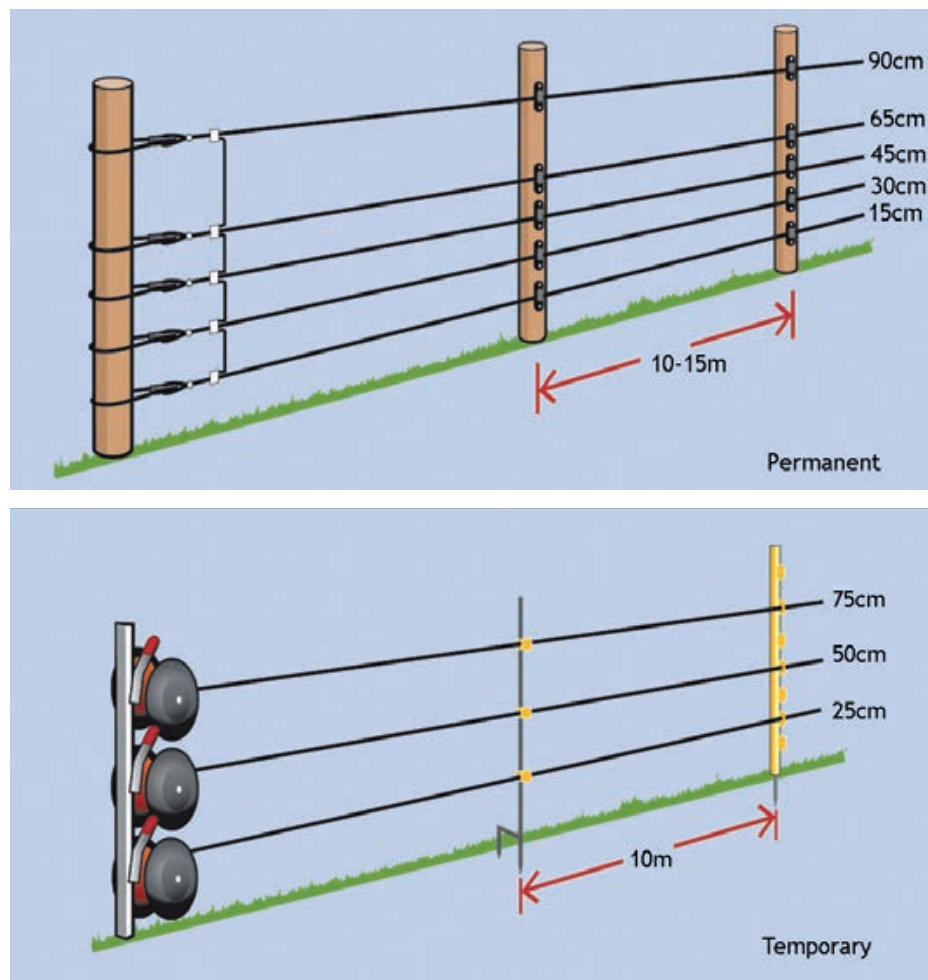
Sheep behind a temporary electric fence

Sheep

Permanent electric fencing for sheep requires up to five strands of wire, with the lowest three strands placed at 15cm intervals from the ground and the highest two placed at 25cm intervals. The lowest wire is often not energised as grass can easily short it out. The ideal spacing from the bottom up is 15cm, 30cm, 45cm, 65cm and 90cm (Figure 3).

Temporary fencing will usually require up to three strands of wire with the lowest two strands at 25cm intervals from the ground, eg 25cm, 50cm and 75cm. The lowest wire should be kept as high as possible to minimise risk of shorting on any vegetation.

Figure 3: Ideal wire heights for permanent and temporary fences for sheep



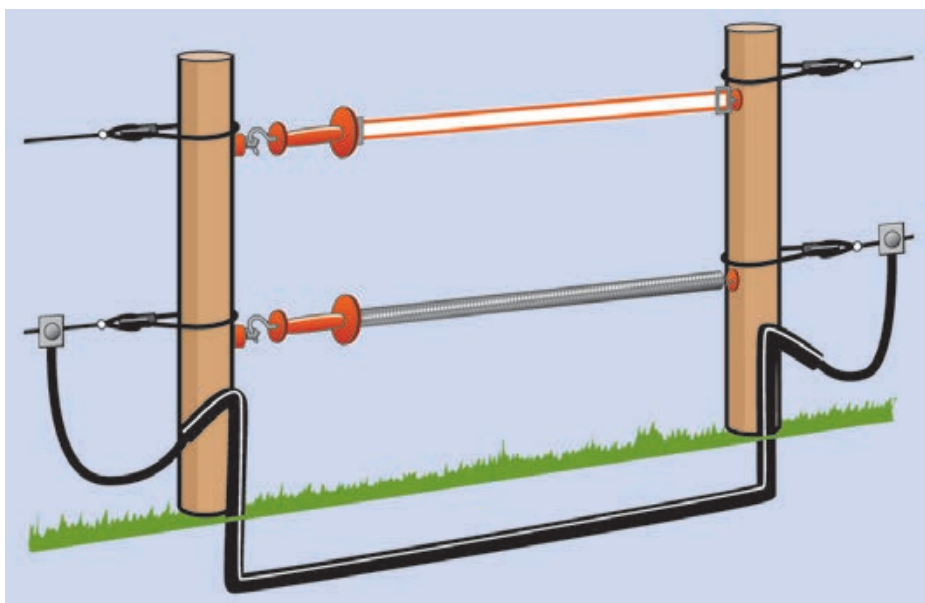
Gateways

A gateway provides a safe break in the fence through which livestock and vehicles can be moved.

The location of the gate must be well planned, as it needs to have an insulated gate hook with tape or a spring to prevent stock crossing when it is shut. A gateway needs an insulator on the handle and on the opposite side to maintain the electrical connection from the fence to the gate.

For permanent electric fences the insulated power cable should be buried underground at a depth of 30cm, in a rigid plastic pipe to prevent damage from traffic (Figure 4). The ends of the pipe must be positioned downwards to prevent water entering.

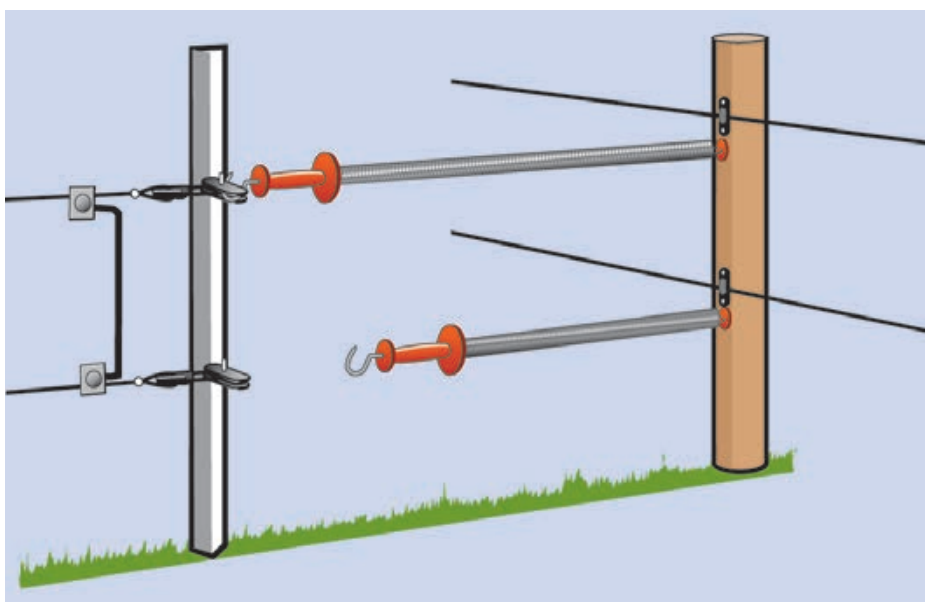
Figure 4: A gateway in a permanent electric fence



For temporary fences there should only be one gateway and these should be placed at the end of the line.

If polywire and fibreglass posts are used, the wire can be 'pegged down' or 'held up' using special posts which allow stock to cross over or under the live wires anywhere in the fence line.

Figure 5: A gateway between the end of a temporary fence line and a permanent electric fence



Training livestock

Training stock can save significant time and hassle when it actually comes to putting them into fields or paddocks bounded by electric fencing.

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Running a multi-strand electric system around the inside of an existing permanent stock fence, provides a safe and controlled environment where stock can become accustomed to it. A training period of three to five days is usually recommended.

Results from Finland indicate that dairy bull calves learned to avoid an electric fence quickly, even within an hour of release into the training area. It also showed that shocks were minimal after the second day and that they continue to avoid the fence in the following grazing season after a housed winter period.

During this research, there was a power failure on day five, which led to increased shocks on day six. This suggests that the cattle continued to test the fence, so regular testing and maintenance are crucial.

Other research projects have shown there is minimal impact on cortisol or endorphin levels, heart rate or feeding behaviour, in cattle that receive shocks compared to those having no shocks or being restrained.

Training cattle

- + Erect a two-strand fence one metre inside the permanent stock fence in a small field using materials that will be used across the farm
- + Ensure the voltage is +4,500V
- + Avoid mixing animals before placing in the field to reduce risk of fighting
- + Introduce animals into the field. Observe for the first hour and check regularly during the first 24 hours
- + Consider direction/height of the sun. If it is low, allow the animals to enter field with the sun behind them so they can see the fence ahead
- + Once all animals have encountered the fence, run a single or two-strand fence across one corner of the field. Observe for the first hour and check regularly for 12 hours
- + Divide the field in half with a fence down the middle. Check the animals during the next 24 hours
- + If the fence has been challenged by the stock, keep them in the field for another 24 hours until they stop doing this



Training ewes with the aid of a permanent hedge on one side

Training sheep

- + Set up a three-strand fence 50cm inside the permanent stock fence in a small field, using materials that will be used across the farm
- + Ensure voltage is +4,000V for shorn ewes or ewes with young lambs and +5,000V for weaned lambs and ewes with fleeces
- + Observe for the first hour and check regularly during the first 24 hours
- + Once all the animals have encountered the fence, run a three-strand fence across one corner of the field. Observe for the first hour and check regularly during the next 12 hours
- + Divide the field in half with a fence down the middle. Check over the next 24 hours

- + If the fence has been challenged by the stock, keep them in the field for another 24 hours until they stop doing this
- + Once the animals are seen to be respecting the fence, experiment with just two wires for ewes to reduce materials and labour

The post-weaning period before tupping is normally the best time to introduce ewes to electric fencing. Lambs learn quickest if introduced while still with their trained mother at a couple of weeks of age.

Do not attempt to train lambs directly after weaning. Leave at least seven to ten days before introducing them to electric fencing.

Health and safety



Warning signs should be used if near a public footpath

Electric fencing is safe for both humans and animals if installed and maintained correctly. It is important to read the information that comes with the energiser to prevent damage or injury during installation.

Always install the correct energiser model for the power source.

Do

- + Display warning signs on all electric fences. If they are near public footpaths, signs should be erected every 50 metres or less
- + Discuss any electric fence erection near a public right-of-way with the local authority
- + Place a non-electrified gate or stile if a public footpath crosses an electric fence
- + Ensure separate fences are at least two metres apart if powered by separate energisers
 - Make sure mains energisers are under cover and out of reach of children

Do not

- Use electric power poles to support electric fences
- Use power poles as an earth
- Electrify barbed wire or other material animals can get entangled in
- Connect more than one energiser to a fence
- Run electric fences parallel with overhead power or communication lines, as this may induce a dangerous high voltage line onto the fence. If lines do have to be crossed, do so at a right angle

Where it can go wrong

- + Poor earth connection

Electricity must complete a full circuit to send a charge through the ground. Poor earth connection gives weak shocks and will not scare the animals. So do not skimp on the ground rods.

See page 8 for how to test the earth system.

- + Stock challenging fences

Allowing stock to experience the fence under a controlled environment will stop them testing the real fences out in the field. Put flags on the fence for visibility.



Long grass touching the bottom wire will reduce the shock

+ Fence posts too close together

The fence should act like a rubber band. When something runs into the wire, it should ideally bend to the ground and pop back up. Higher tension will lead to broken insulators or posts being knocked out of the ground.

+ Bottom wire in contact with heavy or wet foliage

Wet grass will reduce the shock from any fence charger. Lower wires can be connected separately so power can be disconnected if grass gets too tall. Or spray off the grass where the fence is erected if it is where an electric fence or permanent fences are erected.

+ Cheap insulators breaking

Poor quality insulators made from cheap plastic will deteriorate and turn white or clear in sunlight. If possible, source insulators that have been treated to resist ultraviolet light degradation.

+ Solar panels not directly facing the sun

A solar panel will not function at its full potential if not properly installed. Read the manual and follow instructions fully.

+ Wires too close together

Keep the wires at least 13cm apart.

+ No fence tester

A fence tester is needed to check fence voltage. Do not guess.

+ Cheap thin wire

Buying cheap, thin wire is a mistake. The larger the wire, the more electricity it will carry.

+ Inadequate energiser

Animals soon learn to exploit low voltage wire. The fence needs to provide enough voltage in wet weather when there is plenty of foliage touching the bottom wire. Buying a cheap energiser may save £100-£200, but it will cost a lot more than this if stock-damaged fencing has to be repaired.

Identifying a fault

If there is a problem with a fence, follow this process until the fence fault is identified:

- + Measure the voltage on the fence line
- + Check the energiser is working correctly
- + Check the earth
- + Check the connections
- + Check the fence line with a fault finder

Case studies



Dairy cows grazing behind a temporary electric fence

Case study 1

Lewellyn Statton runs a 145ha (360 acre) organic dairy and sheep farm with 140 dairy cows, 100 heifers and 300 ewes. The dairy herd is managed as a low-cost, grass-based system, with the cows fed no concentrates and overwintered on kale and stubble turnips.

Draft Welsh ewes are purchased in October and graze as a single flock on an AGW system. They are lambed in March, then culled with their lambs from June through to August. All animals are rotationally grazed in large mobs to maximise grass utilisation, whilst minimising labour requirements.

The farm has a mains energiser providing power to 70% of the fields, which are fenced with single 2.5mm high-tensile wire and wooden posts.

Larger fields have been split in half with a two-strand permanent electric fence to facilitate further sub-division with temporary fencing.

Cattle are grazed on one to two-day breaks, behind single wire fences with targeted minimum voltage of 3,500V. Ewes are trained when they first arrive using four-wire temporary fences with a minimum of 5,000V.

Benefits

+ Cost

The temporary fencing is less than half the price of the permanent fencing, which has allowed more fields to be sub-divided for the same budget.

+ Security

Once the animals are trained, they do not challenge the fence, which prolongs the life of equipment.

+ Flexibility

The area or 'break' size can be altered to suit the amount of grass feed available. This allows the size of the group to be maintained, which is very important in AGW.

+ Profitable

Temporary fencing equipment can provide an excellent return on investment, through improved grass utilisation and reduction of feed costs.

Lessons

+ Awkward animals

Occasionally individual animals will not be trained. These should be sold or culled to reduce hassle.

+ Materials

Polywire is more resilient to animal challenges than multi-strand steel wire, due to its natural elasticity.

+ Maximum sheep numbers

Four hundred ewes is the maximum flock size contained when using single-day breaks, to avoid excessive pressure on the fence.



Permanent electric sub-division of the field



Creosoted wooden stake and 5 claw-type insulators with high tensile 2.5mm steel wire

Case study 2

Matt and Pippa Smith farm 170ha (320 acres) with land rising to 244m (800ft), with 1,400 Romney and Romney x Lleyne ewes and 25 finishing cattle. All ewes are lambled outdoors and the male lambs are left entire and finished. Around half of the ewe lambs are sold for breeding.

Matt and Pippa took over the farm two years ago and began a major development project to re-fence the property.

Different styles of fence have been used. The best land has been sub-divided with five-strand permanent 2.5mm high-tension wire and creosoted wooden posts, to create several 1.5-2ha breaks.

The field perimeter has been fenced with metal posts carrying netting, a plain wire and a top high-tension electrified wire. This wire is used to transfer power around the farm and provides an instant source of power for temporary breaks.

There is currently a mixture of battery and solar-powered energisers, but the aim is to use a mains energiser once the development work is complete.

In early winter the mixed-age ewes are mob-grazed through the fields, which are sub-divided with two-wire temporary fences. A proportion of these ewes then move on to strip-graze fodder beet behind two-wire fences.

Ewes are set-stocked for lambing, before being drafted into groups of 200-250 and grazed through the permanent sub-divided fields.

Cattle are grazed as one mob on two-day breaks in a single field which are split into two lanes, using a semi-permanent two-strand electric fence. Single polywire breaks are used to divide up the grazing area.

Benefits

+ Cost

This is a cost-effective way of fencing, which allows post spacing to be increased and reducing the damage done by stock, due to the powered top wire.

+ Control

Using electric fencing in most fields re-enforces the message to stock and maintains good control. Newborn lambs quickly learn from their mothers.

+ Accessibility

Fibreglass posts allow fences to be crossed with a quad bike using a special fender kit. This speeds up checking and moving stock.

+ Easy movement

Animals can be trained to cross over a pegged-down fence, removing the need for gateways in temporary fences.

Lessons

+ Wire height

It is critical to have the right wire height, especially where the perimeter fence has to contain different-age animals such as ewes and lambs. A minimum of seven wires is needed, but they do not all need to be powered.

+ Metal posts

Metal posts are more expensive but quicker to install and wire height can be easily changed.

+ Invest in the best

Always invest in the best energiser and batteries possible.



Sub-divided field showing the previous field and current field for grazing

Case study 3

James Daniel farms 121ha (300 acres) in partnership with his parents.

Eight hundred ewes lamb indoors and 300 lamb outside. There are also 10ha (25 acres) of arable crops.

The outdoor lambing ewes are kept on a separate block of rented ground and are rotationally grazed on an AGW system, using temporary fences made of fibreglass stakes and two-strand polywire.

All lambs are finished on farm. There are 8ha (20 acres) of forage rape grown, which is strip-grazed by lambs from November onwards, using three-strand temporary fences.

Benefits

- + Affordable and practical

- + Good for rented land

If the tenancy were to end the temporary fencing can be picked up and used somewhere else.

- + Aids grazing management

Electric fencing is perfect for rotational grazing and allows land to carry a higher stocking rate, increasing the gross margin/ha.

- + Flexibility

Break size can be adapted to flock numbers and available grass.

Lessons

- + Invest in good batteries and energisers

This saves a lot of labour.

- + Train animals

Identify and remove animals that do not respect the fence persistently and remove from the flock.

- + Plan

Consider water provision and vehicle/stock movement before choosing where to put the fence to save hassle.

- + Select right poles

Fibreglass poles are superior to metal as they are insulating and do not short. They can also be used to handle live wires.

- + Right wire

Polywire is better than stranded steel as it is lighter, cheaper, more flexible and more visible.

Appendix 1 - Costings of different fencing options

Costs to erect 300 metres of fence on flat-to-rolling ground with minimal bends. Labour to erect based on good to average ground conditions.

All recommended retail prices correct at September 2015, excluding VAT and are given as a guide only.

Temporary fence - fiberglass posts and polywire			
Equipment	Cost each	Quantity	Total cost
Anchor post	£8.00	2	£16.00
Strut post	£4.89	2	£9.78
Fiberglass post	£3.99	20	£79.80
Insulators	£0.34	75	£25.50
Polywire (per m)	£0.09	900	£81.90
Total materials			£212.98
Material cost per m			£0.71
Labour to erect			£3.75
Labour cost per m			£0.01
Total cost per m			£0.72

Temporary fence - metal posts and steel wire			
Equipment	Cost each	Quantity	Total cost
Anchor post	£23.21	1	£23.21
Reel post	£30.09	1	£30.09
Metal stake	£2.61	25	£65.25
Insulators	£0.35	75	£26.01
Multistrand steel wire (per m)	£0.14	900	£123.30
Total materials			£267.86
Material cost per m			£0.89
Labour to erect			£8.75
Labour cost per m			£0.03
Total cost per m			£0.92

Permanent fence - wood posts			
Equipment	Cost each	Quantity	Total cost
Tanalised wooden 15-18cm strainer post	£8.50	2	£17.00
Tanalised wooden 10-13cm intermediate posts	£2.20	28	£61.60
Claw insulators	£0.25	84	£21.00
Insulator strainers	£0.60	6	£3.60
2.5mm high tensile wire (per m)	£0.08	900	£70.20
Barbed staples	£0.04	180	£7.20
Total materials			£180.60
Material cost per m			£0.60
Labour to erect			£300.00
Labour cost per m			£1.00
Total cost per m			£1.60

Permanent fence - metal posts			
Equipment	Cost each	Quantity	Total cost
Creosote wooden 15-18cm strainer post	£18.20	2	£36.40
Metal pasture post	£3.80	28	£106.40
Insulators	£0.30	84	£25.20
Insulator strainers	£0.60	6	£3.60
2.5mm high tensile wire (per m)	£0.08	900	£70.20
Barbed staples	£0.04	12	£0.48
Total materials			£242.28
Material cost per m			£0.81
Labour to erect			£150.00
Labour cost per m			£0.50
Total cost per m			£1.31

Permanent fence - fiberglass posts			
Equipment	Cost each	Quantity	Total cost
Creosote wooden 15-18cm strainer post	£18.20	2	£36.40
Arrow post	£4.04	28	£113.12
Insulators	£0.34	84	£28.56
Insulator strainers	£0.60	6	£3.60
2.5mm high tensile wire (per m)	£0.08	900	£70.20
Barbed staples	£0.04	12	£0.48
Total materials			£252.36
Material cost per m			£0.84
Labour to erect			£120.00
Labour cost per m			£0.40
Total cost per m			£1.24

For more information:

For more information contact: Better Returns Programme

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