Fencing Poultry by Michael Sommerlad

Fencing of livestock in Australia has been traditionally viewed as a tool for the protection, containment and control of stock, and whilst these are obviously important roles of fencing, they should not be viewed as its only roles. Fencing can also be employed as a management tool, providing control over grazing frequency and intensity, managing peaks and troughs in pasture growth, controlling parasite burdens, encouraging the reproduction of certain plant species and even 'training' stock to become used to human contact. This article concentrates on the fencing of poultry, using conventional and electric fencing, but the principles can be applied to fencing other livestock as well.

Although there are a number of different types of poultry enterprises pursued in Australia, with specific fencing requirements for each, there is one element common to all and that is effective protection from predators.

Protection from predators

All forms of poultry are susceptible to attacks from a number of predators, some of which are quite large and aggressive, and birds must be adequately protected from these animals. Most predators are common to virtually every part of Australia (with the hopeful exception of foxes in Tasmania) and major species are cats, dogs and foxes, with dingoes, quolls, birds of prey, rodents and snakes prevalent in certain areas. The majority of stock losses come from foxes, dogs and cats, and these are the three species we will focus on. Obviously, dingoes and quolls, being similar to these three are also adequately covered.

To effectively preclude any creature using a fence, an understanding of that animal's physiology and behaviour is important. Our target species are usually (although by no means exclusively) nocturnal; using the cover of darkness to approach otherwise exposed or closely settled areas. They are driven by curiosity and hunger, the latter magnified if offspring need to be fed. They can all jump a reasonable height (at least 1.2 metres) and many individuals are adept at climbing. It is obvious therefore that something more elaborate than a sheep or cattle fence is required to keep these blighters out. Remember, a predator fence must be reliable; a single breach may well devastate an entire batch of birds. The traditional approach to predator fencing has been the use of prefabricated materials, that is, woven or welded

mesh or netting in a "conventional" fence. These products are perfectly fine, as long as they are correctly installed, and that the particular limitations of each type of product are understood.

The single most important factor for consideration with prefabricated products is cost. It is possible to construct a fence through which no creature on Earth will pass, but the cost would be unbearable. Therefore, any fence constructed should be a careful compromise between the actual, physical job the fence must do, and the capacity of the enterprise to carry the cost. The value of the stock to be protected must also be considered, whether it be the market value of the stock (a shed full of laying hens producing hundreds of dozens of eggs per day) or the intrinsic value (a handful of irreplaceable breeding birds). In either case any loss sustained through predator attack would have a profound effect on the viability of the operation.

How do you decide on what sort of product to use? Simply stated, the mesh size must be small enough to prevent the smallest representative of the target species to pass through, (and prevent your chickens from getting out), whilst at the same time be strong enough to prevent the animal forcing or chewing their way through. The total fence height must be great enough to prevent jumping or climbing over and some effective way of preventing animals burrowing underneath the fence must also be employed. If netting alone were to be used, then the fence should be constructed out of wire 1.6mm in diameter, with netting holes about 50mm, and a total height of 1.8m. Provision should also be made for at least 300mm of netting to be buried in the ground or laid on top of the ground back out into the direction of approach of the predators. A fence like this would cost between 3 and 4 thousand dollars per kilometre to construct, and provisions would need to made to prevent "climbers" from scaling the netting or the posts, and the netting in or on the ground would have to be replaced every few years depending on rainfall, soil type, plant growth etc.

The alternative to a conventional fence is an electric fence, but what is an electric fence? An electric fence is a fence that utilises familiar fencing materials (wire, posts etc.); the difference being that an electric current is passed down the wire by a device called an "energiser", with the aim of imparting a non-harming shock to whatever touches the "hot" wire. Electric fences can be enormously cost effective, and very efficient in the control of animals, however it

is a job that must be done correctly, otherwise the installation becomes a liability rather than an asset.

To build an electric fence for predator control requires careful planning and execution, and really is a job for an expert. The critical issues are wire spacing, post/dropper spacing, energiser selection, configuration of the electrics, energiser protection and monitoring systems. This fence cannot afford to be down for a second, so everything must be done to ensure that it is constantly operating at peak efficiency. This type of fence would be much cheaper to construct than the netting fence described above, but does have a couple of technical implications that often make it less than ideal for the tyro to attempt unassisted.

It would appear that conventional and electric fencing are not without some inherent faults, but remember, no fence that a mere mortal can afford to construct is perfect, they all have limitations. There are ways however, to overcome many of those limitations, the most practical and cost effective method is to combine a conventional, netting fence with an electric fence. In doing this the inherent weaknesses of both types of fence can be identified and overcome, creating a reliable cost effective barrier to the entry of predators, with reliability being of paramount importance.

When planning and constructing a "composite" (conventional and electric) fence, it is useful, although not entirely accurate, to look at the fence in two parts: the conventional fence as the 'primary' fence, and the electric as the 'secondary'. These titles are for the purpose of simplification only, and the fence is very much a complete entity in its own right. The primary fence acts as the frame or skeleton onto which the secondary is attached.

Because we are now utilising electric fencing, certain features of the primary fence can be changed. First, the fence does not need to be so high, because we will use electricity to prevent jumping or climbing. Secondly, the netting does not need to be made from quite as sturdy material, as the electricity will prevent them from hanging around and chewing on the fence. Finally, the fence does not need to be buried, because the electricity will be used to prevent close association with the bottom part of the fence. The primary fence can therefore be 1.2m in height. The bottom, rather than being buried, is now attached to a well- tensioned (or 'strained') bottom wire, which should maintain

a distance of between 25 and 50mm above the ground at all points along the fence wire. My personal preference for this job would be 2.5mm "Flexabel", a nominally high tensile wire that is good to work with, relatively cheap and is the same wire that I would use in an electric fence, so you don't have multiple coils of wire on the job. The netting or hole size should remain at about 50mm. Straight away we have saved on nearly 50% of our netting cost, because now we are using a lighter gauge wire plus we only need it to be 1.2m in height, as opposed to the 2.1m (1.8 m above ground and .3 m below or along the ground) in the conventional fence. We still need to build the electric fence yet, so some of that saving will be taken up there.

I have purposely avoided the issue of fence construction techniques, as this is a subject in its own right, and is far too complex an issue to cover adequately in this article. Suffice it to say that only quality products used in accordance with recognised fencing practice should be used. The larger fence material manufacturers publish booklets on fence construction techniques, and there are a number of excellent books on the subject. If there is any doubt in your mind, please seek the assistance of a professional. A well-constructed fence is an asset that will last for decades, and should provide great peace of mind that your valuable livestock are safe and secure. A poorly constructed fence is nothing short of a liability, requiring constant repair and maintenance, without any guarantee of adequate security for the stock it contains. This primary fence will also be used as an "earth" for the secondary fence.

With an idea of what our primary fence will look like, let's look at the secondary fence. This electric fence has some very specific functions to perform, and these need to be clearly understood before embarking on construction. These functions have already been stated earlier in the article, and they are to prevent jumping or climbing over the fence, to prevent forced passage through the fence, and to prevent digging underneath the fence. Let's look at digging first, because this is the most critical area of the fence. When discussing electric fencing it is important to remember that this type of fence is a psychological barrier as well as a physical one. An electric fence works by conditioning a creature that the shiny wire can impart some level of pain. It is therefore extremely important that a creature's first experience with an electric fence is an unpleasant one, and there are a couple of ways of achieving this. The first is to position the wires so that the target animal is most likely to come in contact with them. To

do this an understanding of physiology and behaviour are required again. The average fox is only about 400mm high at the shoulder; the average dog is only 100mm taller. If you were to observe either creature when they were quietly hunting, undisturbed and oblivious of your presence, you would see that both spend a good deal of the time with their heads near the ground, smelling. Every now and then they will stop and raise their heads, to look and listen, but they rely on their senses of smell and hearing more than sight. So when such an animal approaches the fence, they will use their nose to investigate. This means that the most likely point of contact with the fence will be somewhere between ground level and approximately 200mm above ground level, and this is the area that requires the greatest concentration of wires, and we will look at actual wire spacing later (see diagram 1).

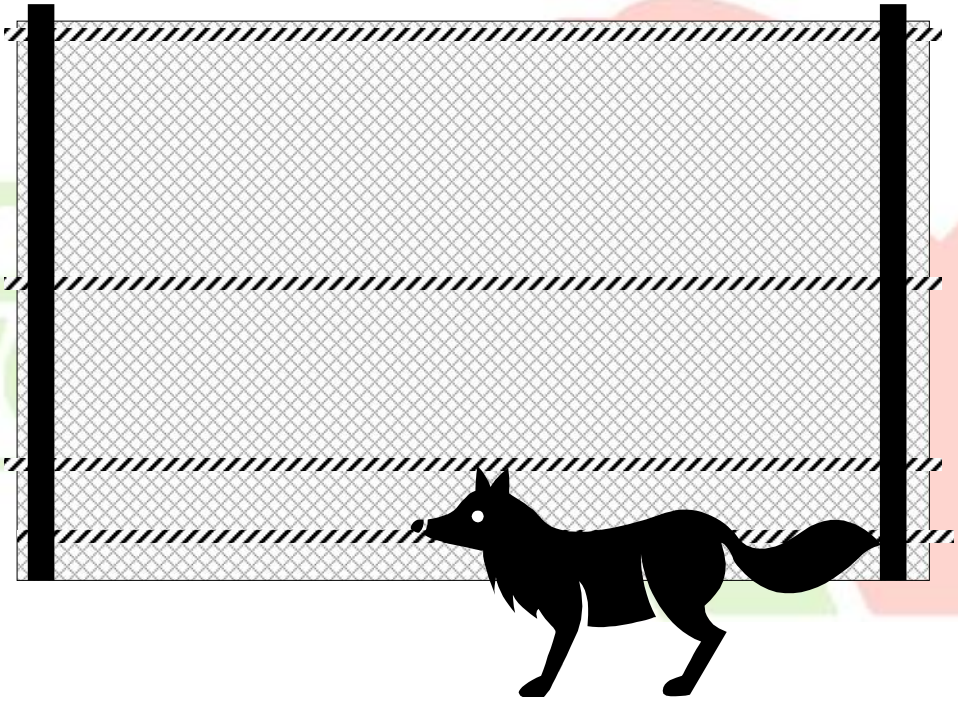


Diagram 1

'Hot' wire

A simplified diagram showing how a fox (or dog) generally approaches a fence – the most likely point of contact will be somewhere between ground level and approximately 200mm above ground level. This is the area that requires the greatest concentration of wires.

The next point to remember when trying to give your target species an unpleasant introduction to electric fencing is to ensure that the wires are always energised. This means that when you are constructing your fence; make sure that you can electrify any "hot" wires before you knock off for the day. Even if you only have one panel erected, so that the animals can walk around the fence, still heat up any electric wires. When you leave, and darkness falls, the vermin you are trying to preclude will be wandering about, eating the crusts of the sandwich you had for smoko, and checking out this strange object that wasn't here yesterday. As they sniff about they may contact a shiny, new wire, if it's hot, they have just had their 'rude introduction', and will treat all shiny wire with some respect and disdain. If that wire is not hot however, they have learned that this new structure poses no real threat, and next time they challenge it they may well be more forceful, and be part way through the fence before they get a 'belt'. Please remember this principle when using any sort of electric fence on any sort of creature, **never turn it off**. So many electric fences fall into disrepair because "the cows weren't in that paddock anymore", or "the rams had been taken away", and the fence gets turned off. The livestock and other animals, particularly the 'roos and wallabies, soon learn that the fence is off, and start forcing their way through. An electric fence is a psychological barrier; it must be operated as such. The amount of power an electric fence energiser draws is miniscule, because even though they can generate up to 10,000 volts, the amperage is measured in milliamps, that is thousandths of an amp! So don't be concerned that your power bill is going to go through the roof, it won't.

Whilst on the subject of energisers, there are many different makes and models on the market these days, and if you are uncertain as to your specific requirements, seek expert advice. One crucial and largely misunderstood point is that of the 'power' or 'output' of the energiser, normally measured in joules. Most manufacturers also have a recommendation for how much fence the energiser will run. Use this as your guide, and **always** buy the biggest unit you can afford, not the one that is advertised to do the job you currently have at hand. There are a number of reasons for this. First, an energiser that is just powerful enough to do the job you are currently working on, will struggle to perform if you decide to add more fence, or if the load on the fence increases, for example, if long, lush grass (anyone remember that stuff?) grows up into the hot wires, creating a short circuit ('short'). The other point is that when factored in as part of the

overall fence price, the energiser is one of the least expensive components. For example, if your fence is going to cost $2500 per kilometre, without the energiser, and you are going to build 2 kms of fence, then you are going to spend $2.50 per metre, or $5000 in total. If a minimum specification energiser costs $250, then it is going to add 12.5 cents per metre to the total fence price, and has no capacity for you to add more fence in the future. If, however, your energiser costs $500, it adds 25 cents per metre to the fence price, but it allows you to expand the fence at any time. This means, that if you add another 4 kms of fence in the future, the price of the energiser drops to about 8 cents per metre, less than the minimum spec. energiser, and still with enough capacity for you to continue to add further fencing if you so desire. It will also cope far better in those times of lush grass growth.

As mentioned earlier in the article, I have avoided any detailed discussions of actual fence construction technique; however there are a couple of important points that need to be highlighted. The most important of these is the issue of 'earthing', that is, providing adequate and appropriate earth for the safe and reliable functioning of your fence. Without getting technical, 'earth' is required to complete a circuit (a flow of electricity) within any electrical system. When you construct an electric fence, you will need to install some form of earth, the type is largely dependent on your location with regards to soil type and moisture content. Some soils are quite easy to establish an adequate earth; the rich, damp soils of some coastal dairying areas are a good example, whereas very dry soils and those that are "chemically" unsuitable can create some difficulty when establishing an earth. Seek the advice of the manufacturer of your energiser as to their recommendation for your location. Not only does an adequate earth ensure the reliable functioning of your fence, it also can contribute enormously to the protection of your energiser from lightning strike (more on this later). Whilst on the subject of earth, always ensure that the earth wires in your fence are connected to the earth that you have established at the energiser. This is referred to as a "fence return" system. Remember, there is no electricity without earth (for the purpose of this illustration) and for a creature to "feel" the current that is being passed along the wire; it must act as a conduit between the electrical current and earth. Most of us are familiar with the traditional single wire electric fence, still commonly used to strip graze cattle in fodder crops. This type of fence relies on the animal making a suitable contact with earth through its hooves, and is quite effective over short distances, in rich, damp soils with

large, heavy animals like cattle. This is called an "earth return" system. When constructing a fence that is designed to control comparatively smaller animals under all types of soil conditions, sometimes considerable distances from the energiser, then an earth return system is simply not reliable. By ensuring that all earth wires are all joined to each other and to the earth at the energiser, the full potential of the energiser can be expected to be felt many kilometres from the energiser.

The other point to note is that of lightning protection. Thousands of energisers are destroyed each year in Australia through lightning strike, and the majority of these could have been avoided if adequate protection measures had been put in place. If you suffer a "direct hit" on your fence, that is, if a lightning bolt hits your fence, the chances of your energiser surviving are quite remote, if it is still connected to the power supply and the fence. If it is disconnected however, no damage will be incurred. The approach of an intense electrical storm is one of the rare occasions when the energiser should be turned off and disconnected. Most of the energisers damaged by lightning have not suffered a direct hit, but a less severe event sometimes described as a "field strike". This occurs when the lightning contacts the ground near the fence, and the electrical current runs along the ground to the fence, particularly in times of heavy rain. If appropriate measures aren't taken, this extremely high voltage will travel along the wires of your fence till it finds somewhere to earth, possibly your energiser. Most electric fence manufacturers have some sort of lightning protection devices, and you should seek their advice on which is most appropriate for your application. However, by ensuring you have an adequate earth at the energiser, and that you use a "fence return" system, you will greatly enhance the chances of your energiser surviving a field strike.

The positioning and spacing of the wires in the secondary fence are somewhat dependent on the nature of the fence, but, once again, a couple of basic principles are common to virtually all fence types, and as we are focusing on a fence between ground level and 200mm above ground level as a point of initial contact for a would-be predator, let's use this as a working example. The interesting and challenging part of a fence as close to the ground as this is to be able to effectively manage the potential problem of the electric fence shorting out because of its proximity to the ground and vegetation. Assuming the energiser being used to power the fence has the capacity to cope with

some vegetation, the next thing to work out is where to place your wires in the fence, and how to use them. Once again, most manufacturers have manuals that provide diagrams that have a guide to wire spacing, and I will share my favourite now. Remember as we go through this process that we are looking to provide the maximum shock to a dog sized animal on its first contact with the fence. To prevent the predator from going underneath the fence, we need a wire down as close to the ground as possible, the problem being that if this wire is energised (hot) then it is exposed to the threat of shorting out against the ground or low vegetation. To overcome this problem, make the first wire an 'earth', and place it as close to the ground as practicable, and no higher than 100mm above the ground. Then we make the next wire the first hot wire, and place it about 150mm above the first. Now, when our would-be predator comes to the fence, it can't get underneath the fence, so it tries to climb through. After all, there's plenty of room to fit the first part of its head through, and it looks a lot easier than the netting behind. What happens next is exactly what we should always aim for with our electric fence design; our target animal should get the full potential shock that the energiser has to offer, because it comes into contact with an earth and an energised wire. Result, one very shocked and frightened animal, an animal that will think long and hard before it comes near that structure again. To complete my favourite design for this sort of fence, simply add another earth wire between 150 and 200mm above the first hot, then another hot 200mm above that. This wire spacing should provide adequate protection to the most vulnerable and regularly challenged part of a netting fence.

There are a couple of ways that this combination of low wires can be added to the netting fence. One is to utilise the existing posts, however this places the electrified wires dangerously close to the netting in the fence behind, and if that netting were to come in contact with the 'hot' wires, a dead short would be the result, and the fence would cease to function. This is not as big a concern for the wires halfway up and at the top of the fence, but can be a real problem at the bottom of the fence where the species being protected by the fence may push the netting into the 'hot' wires. The other, and I believe safer way to add this part of the electric fence is to use short posts that are attached at an angle to the fence, as in the diagram no.2. This method keeps the wires away from the netting, and helps to simplify construction. Stockists of electric fence supplies will be able to supply these short posts, and I suggest you try and source the posts

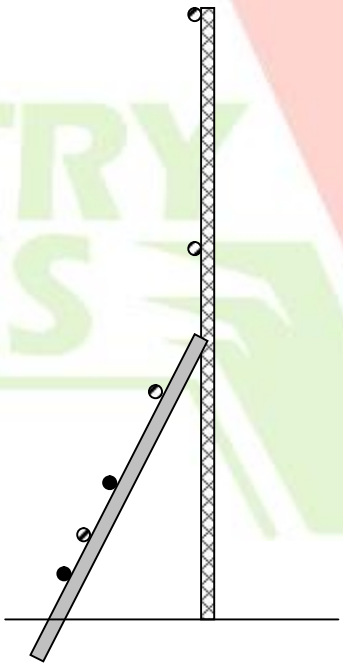
with the sharpened point, so that the post can be driven into the ground, and the top secured to the existing fence.

Diagram 2

——————— ***'Earth' wire***

//////////// ***'Hot' wire***

This diagram shows a short post driven into the ground at the bottom, and secured to the netting fence at the top.



Next we need to prevent predators from climbing up and over the fence, and this can be done quite simply by placing a hot wire about half way up the fence, and another right near the top. These wires should prevent those creatures prone to climbing from gaining access

to your birds, and also prevent any domestic animals, particularly cattle and horses from rubbing on the fence, drastically improving the life of the fence. These simple guidelines should assist in the design and construction of the all important predator proof perimeter, but what about inside, what's the best way of separating different groups of birds?

Separating Different Groups of Birds

The first thing to point out here, is that if you are running a commercial operation and you want it to survive into the future, don't place birds of different ages in adjoining pens. The potential for the spread of disease is very great, and different aged flocks should be kept as far apart as possible.

Fencing some strains of layers can be quite challenging, as their capacity to fly makes them difficult to contain, particularly if they are a flighty strain, if they have been inappropriately handled and 'trained', or if they are not correctly nourished, which encourages them to wander, seeking the appropriate supplements for their inadequate diet. Any of these factors, or a combination, will cause layers to become flyers, and once they get into the habit, they are very hard to stop. So, don't continue to purchase a strain of bird if it is too flighty, make sure you spend time with the birds, so that they become accustomed to your presence, and make sure your birds are getting a full and balanced diet. If all these things are in order, then layers should be able to be contained behind a 1.2m light netting fence, without a top wire, so the fence is floppy, and doesn't provide a stable perch. This sort of fence normally needs to be of a permanent nature, and means that your pens will always be the same size and shape, without any flexibility to expand or change without adding more fence. This is the reason many of the poultry yards seen in this country are barren, because the birds run on the same ground for the duration of the batch, but it doesn't need to be that way. By rotating pens, birds can be given access to one run for a while, and, at the discretion of the manager, they can be shifted or rotated into an adjacent run before all the vegetation is destroyed. This means that the birds will have access to vegetation at all times, ensuring healthier birds, better quality eggs and a small decrease in feed consumption. This rotational system can be constructed of conventional netting, which would mean constructing a considerable amount of infrastructure, with no flexibility in the location or dimensions of the

fence. There is however, a flexible and cost effective solution to this situation, in the form of electric netting. This product is made from a material similar to the polywire type product used for strip grazing applications that is made into a netting, remotely resembling ring lock. The advantage of this product is that is completely flexible, so that the dimensions of the fence can change with the needs of the operation. It is also very effective in keeping predators out, so can act as a second line of defence. Please note however, that I do not recommend using electric netting for your primary defence against predators, particularly in rural areas where predator numbers are relatively high. Electric netting gives the producer the ability to change their fence to maximise the utilisation of pastures, by increasing stocking densities during times of vigorous pasture growth, and then decreasing the density in dry or cold times. This sort of flexibility could not be achieved with a fixed fence.

When fencing broilers, the same general principles apply as for the layers, with the two main exceptions that the broilers are only around for a short time, and they are far less active than the layers, and certainly not prone to much flying at all. Low fences, up to one metre, are generally all that is required to contain broilers, and electric netting is once again a good choice for broiler fencing.

Fencing is a time consuming, and reasonably costly affair. Take the time to understand your needs, both current and future, plan effectively and honestly, and then invest in a fence that will serve you into the future, not ‘till tomorrow.