



EXCLUSION FENCING FOR FERAL PIG CONTROL



This practical guide provides advice that will help you manage pig problems in the Dry Tropics region.

Several techniques are available to control feral pigs. Generally no stand alone technique is sufficient for each situation so a suite of integrated techniques or combination of methods is necessary. When developing a pig control strategy, managers need to consider what problems the pigs are causing and then decide which control option or combination of options is most suitable to reduce the problem.

Fencing can be an effective technique when integrated with other control techniques or for reducing pig damage to high value agricultural areas or where other control techniques are not possible.

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INTRODUCTION

Excluding pigs from areas by fencing can be a very effective method of reducing the economic impacts of feral pigs (*sus scrofa*). Fencing may be initially expensive; clearing fence lines, material and labour cost can be high, however these costs can be offset over the life time of the fence making fencing cost effective over time. The prevention of economic losses from high value areas such as high value crops or animal enterprises over time will generally more than offset the initial cost of the fence. Generally, the cost effectiveness of a pig-proof fence is related to whether the fence is effective at preventing crossing, cost to erect and maintain, area to be enclosed, life of the fence, and the value of the resource that is being protected. Fencing is especially beneficial in reducing the impacts of feral pigs on small, high value areas of natural or agricultural resources. Since feral pigs are large, robust animals reaching up to 115 kg in size, fences must be equally robust to exclude them. If a pig is sufficiently motivated it will eventually breach a fence and therefore it is important to erect exclusion fences before pigs become accustomed to utilising the enticing food or water source that is enclosed. Once pigs becoming habituated to a pathway and are aware of a food or water source, placing a fence in their path will generally be unsuccessful.



The ADVANTAGES of exclusion fencing include:

- Most suitable for protecting valuable enterprises in relatively small areas.
- Effective method of reducing or eliminating damage quickly.
- Can be cost effective with eliminated or reduced damage over time offsetting the initial cost of the fence.
- Can be used for localised eradication.
- Low risk to non-target species.
- Electrification of existing fences reduces initial costs.

The DISADVANTAGES of exclusion fencing include:

- The pig population is not reduced.
- High establishment costs.
- High maintenance costs, especially vegetation control.
- Subject to failure with adverse weather conditions or high grass growth.
- Pigs will sometimes break through fences if a high value resource is inside.
- Not suitable in large areas or in remote locations.
- Problems for the dispersal of native species, especially threatened species conservation.
- Non-targets may become entangled in the fence.
- Human error in leaving gates open or low maintenance/inspection rates.

Fencing can be used to create management units for effective feral pig eradication in localised areas. However, considerable resources need to be available, for example in protecting extremely valuable areas, since the method is very expensive and requires ongoing resources to maintain the fences. Fencing can also increase the effectiveness of other control methods by preventing immigration. However, across broad areas, the technique may simply redirect feral pigs to other areas and is best used with an additional control method in order to limit the level of feral pig damage. Fencing

was used in the 5000 feral pig eradication program on Santa Cruz Island, California, where the 25,090 ha island was divided into five fenced eradication zones by 56 km of pig proof fencing. The areas were then hunted by ground shooting and using dogs to clear them of feral pigs. The fences proved successful in restricting migration between the areas. Fencing is also used exclusively in Hawaii where fenced areas are constructed, cleared of pigs by dog hunting and then new fences are extended into new areas. Using this method, large areas of Hawaii national park was cleared of feral pigs.

FENCE DESIGNS

Generally pigs do not go over or under fences, but rather tend to go through the fences.

Pigs will not jump unless forced to so; a barrier of only 1 m high is an effective deterrent. There are a variety of fence type available, including electric, netting and barbed-wire fencing. A study in 1983 assessed the ability of 8 fence designs to prevent feral pigs crossing from one paddock to the next. A high pig density of 67 feral pigs per hectare was used to severely test the fencing types.

The results from the study clearly showed the superiority of electrified fences and the box or hinge-joint fences over the plain strand wire fences. Only 1 fence, a 8-80-15 hinge joint netting, was feral pig proof with no pigs able to breach this design whether electrified or not. Generally the most successful pig-proof fences are also the most expensive. The most effective pig-proof fences found are a combination of fabricated sheep mesh held close to the ground by a plain or barbed wire and supported on steel posts with electrified outrigger wire(s).

NETTING FENCES

A range of wire netting designs are available for feral pig fencing. Standard commercially available pig or sheep netting, usually 180/5/1.6 wire size, is ideal for pig fences. Barbed wire at the bottom and 10cm from the ground will greatly assist in preventing pigs lifting the netting. A plain belly wire and a top wire will also assist in maintaining fence tension. Barbed wire on top of the fence is not recommended as non-target species get caught up on the wire and generally pigs do not jump. Post spacing is dependent on the soil type and topography however a spacing of 3m has been shown to be adequate.

Long life netting (plastic coated) and galvanised steel posts assist in preventing corrosion.

This netting fence has excluded pigs for 6 years with only yearly maintenance.

Vegetation control is required to prevent animals running into overgrown fences and damaging the fence. Trees growing in the fence line will eventually destroy the netting, resulting in breaches.



A barbed wire has been clipped to the netting at ground level. The top plain wire is used to prevent non-target hook ups.

ELECTRIC FENCING

Electrification has been shown to significantly reduce the number of feral pigs crossing fences. Electric fencing works by "educating" pigs to associate touching the fence with receiving an unpleasant shock. This is the same principle as barbed wire, but it presents a much more powerful deterrent.

ADVANTAGES of electric fencing are:

- An electric fence can perform the same task as a conventional fence using much less material and construction labour, therefore reducing costs.
- Quicker and easier to build especially in difficult terrain due to lower wire strains and generally lighter construction materials.
- Extended service life as electric fences are not subjected to the same physical pressure from pigs. The life of old fences can be considerably extended using electric fencing.
- Educated pigs develop greater respect for electric fencing than for any other type of fence.
- The maintenance requirements of electric fencing are generally less than conventional fences.

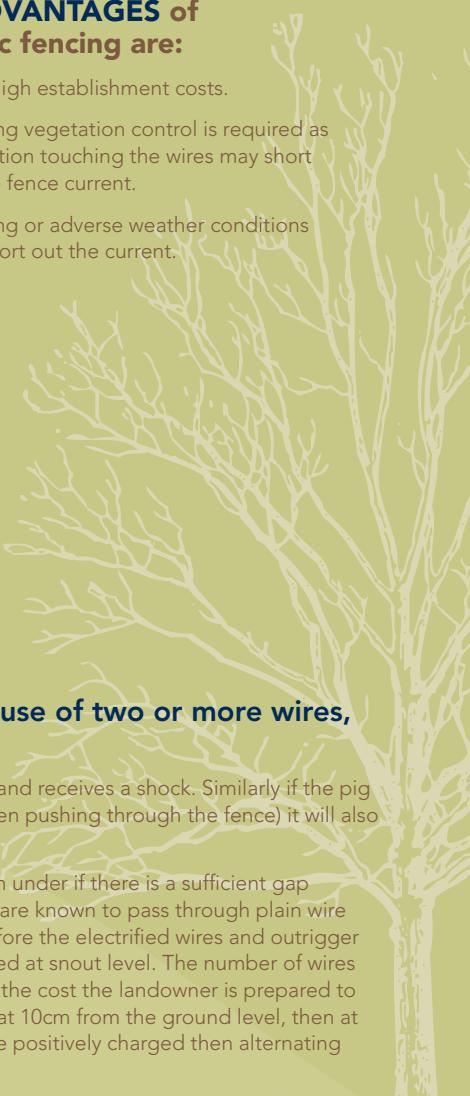
Standard electric fencing consists of the use of two or more wires, either positively or negatively charged.

When the pig touches the positive wire it earths the circuit and receives a shock. Similarly if the pig simultaneously touches the positive and negative wire (when pushing through the fence) it will also receive an electric shock.

Although pigs prefer to pass through fences, they may push under if there is a sufficient gap between the base of the electric wire and the ground. Pigs are known to pass through plain wire fences usually between the wires at their snout level. Therefore the electrified wires and outrigger wires attached to stakes to form tripwires are commonly used at snout level. The number of wires to use is dependent on the level of protection needed and the cost the landowner is prepared to spend. A minimum of 4 wires is usual with the bottom wire at 10cm from the ground level, then at 10cm, 15cm and 20cm spacings. The bottom wire should be positively charged then alternating

DISADVANTAGES of electric fencing are:

- Initial high establishment costs.
- Ongoing vegetation control is required as vegetation touching the wires may short out the fence current.
- Flooding or adverse weather conditions may short out the current.





wires of negative and positively charged wires. More wires at closer spacing will be more effective. Post spacings will depend upon the terrain, the number of wires and the level of physical security required. A wide variety of posts can be used, including timber, steel and fibreglass posts. Insulators must be used on all steel and wooden posts, while special clips are available for use with fibreglass posts. Earthed wires should never be insulated in the fence. The recommended wire diameter is 2.5mm medium tensile wire for general use of greater than 2.5 mm for long distance lead outs.

The Bi-Polar System has a number of advantages over the conventional earth or fence return systems that, in certain circumstances, can be of great benefit. Bi-Polar fencing is now widely used throughout Australia with great success. The energiser sends out 2 powerful simultaneous pulses of energy; 1 pulse is negative and connects to 1 set of wires, while the other pulse being positive is connected to the other set of wires. For maximum benefit, it is recommended that each successive wire should be of the opposite polarity. When an animal touches any wire, either negatively or positively charged, the animal will receive a shock through the earth return system. Similarly, when the pig touches both a positively and negatively charged wire, such as when it tries to push through the fence, it will receive a double strength shock. So, touching any part of the fence will result in a shock and will still work effectively in dry, sandy soil where the earth resistance is too high to provide a good earth circuit.



In this example, 4 electrified wires are attached to a standard cattle fence. The bottom wire is no more than 10cm from the ground to prevent pigs pushing under.

A single strand of barbed wire at the base of the fence will also assist in slowing down the pig, enabling the electric wire to give a full shock to the pig.

Pigs will generally not jump the electric wires but tend to push through at snout level.



An example of the effectiveness of electric fencing; no pig diggings are seen inside the fenced-off block of cane on the left.

Continuous maintenance is required to repair breaches made in the fence by native animals, fallen timber or floods. Electric fences require control of vegetation growing underneath the fence to prevent shorting. Pigs are also most active at night when dew covered grass is more likely to short out or drain the electric fence.

COMBINED CONVENTIONAL & ELECTRIC FENCING

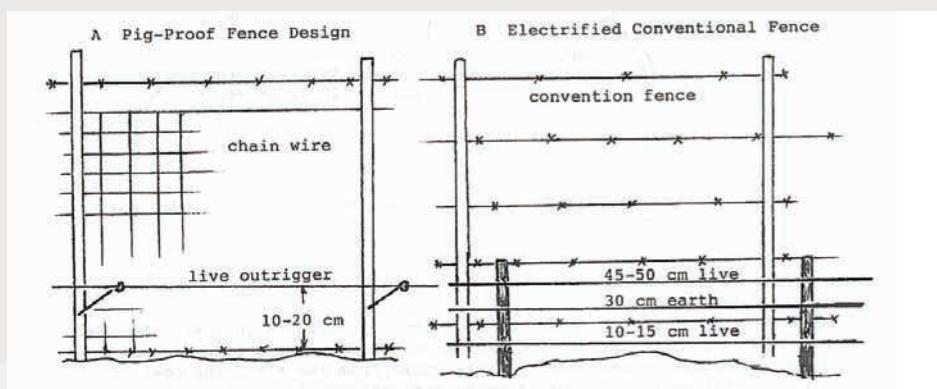
Electrification is the cheapest and simplest method of modifying existing fences to pig proof standard.

This can be achieved by incorporating 1 or 2 live out-riigger wires, 20-30 cm high and approximately the same distance out from the fence. In dry soil conditions, an earth wire should be included below the single wire or conversely, midway between 2 live wires placed at heights of 10-15 cm and 45-50 cm offset from the netting or electric fence. Electrifying conventional sheep mesh fences greatly increases their effectiveness

and minimises maintenance requirements due to pig damage. A combination of netting and electric wires is the most successful in preventing pigs crossing.

While the more costly hinge-joint fences are more effective in restricting feral pig movement, the electrified version of a strand fence may be the most cost-effective.

The most effective fence design features 8/80/15 hinge joint, steel posts at 5m intervals, 2 top barbed wires and electrified outrigger wires 10 and 25 cm above ground level. This electrified fence design can cost up to \$3500/km to construct.



Pig-proof fences (A) are expensive to construct but are very effective. Electrifying a conventional fence (B) greatly improves its effectiveness and will add years to its life. In moist soil conditions a single live wire as in "A" will suffice.

Acknowledgements

This manual contains practical advice on feral pig control strategies for land managers in the North Queensland Dry Tropics. This initiative is funded by the Australian Government - Caring for our Country, supported by NQ Dry Tropics.

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Exclusion Fencing of Feral Pigs

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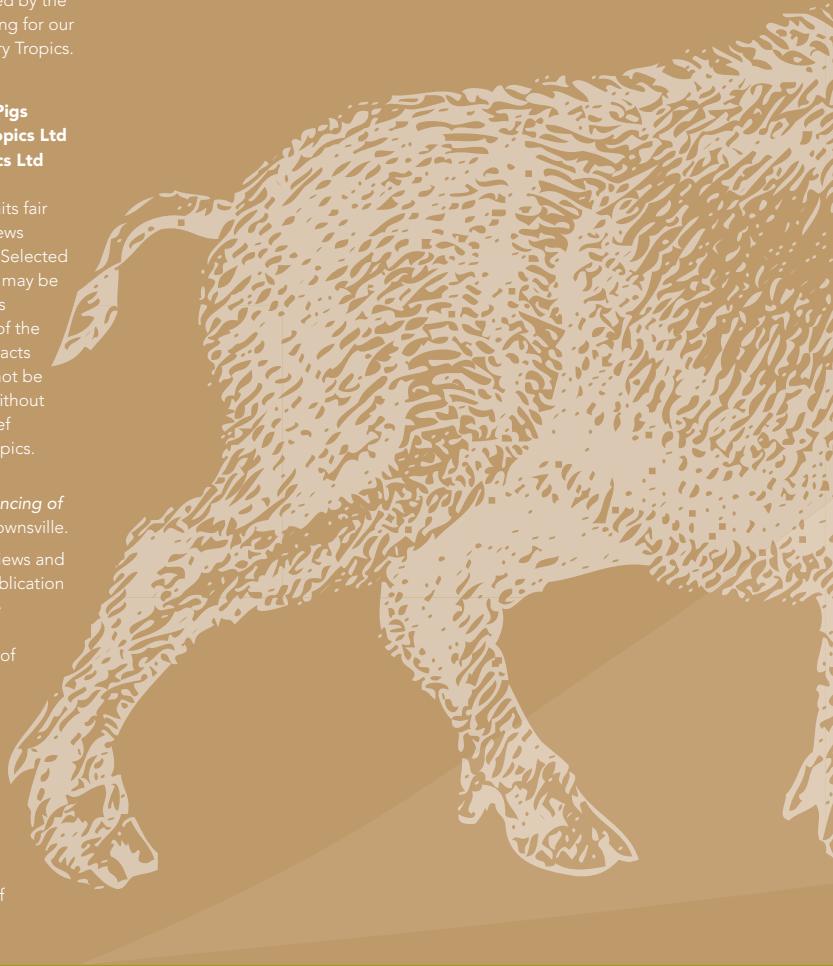
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Please reference as:

Mitchell, J 2011, *Exclusion Fencing of Feral Pigs*, NQ Dry Tropics, Townsville.

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