



Snake cactus (*Cylindropuntia spinosior*)



Coral cactus (*Cylindropuntia fulgida*)



Common pest pear (*Opuntia stricta*)



Velvety tree pear (*Opuntia tomentosa*)



Jumping cholla (*Cylindropuntia prolifera*)



Hudson pear (*Cylindropuntia pallida*)



Eve's pin cactus (*Astrocylindropuntia subulata*)



Opuntia sulphurea



Bunny ears (*Opuntia microdasys*)



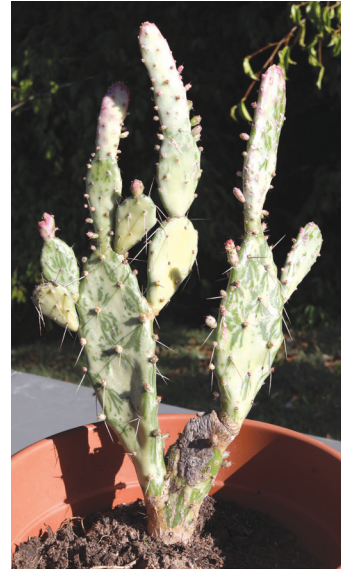
Tiger pear (*Opuntia aurantiaca*)



Riverina pear (*Opuntia elata*)



Drooping tree pear (*Opuntia monacantha*)



Variegated (*Opuntia monacantha*)



Devil's rope pear (*Cylindropuntia imbricata*)



Wheel cactus (*Opuntia robusta*)



This fact sheet is developed with funding support from the Land Protection Fund.

Fact sheets are available from Department of Agriculture and Fisheries (DAF) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DAF does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

Parthenium

Parthenium hysterophorus



Parthenium is a vigorous species that colonises weak pastures with sparse ground cover. It will readily colonise disturbed, bare areas along roadsides and heavily stocked areas around yards and watering points. Parthenium can also colonise brigalow, gidgee and softwood scrub soils. Its presence reduces the reliability of improved pasture establishment and reduces pasture production potential.

Parthenium is also a health problem as contact with the plant or the pollen can cause serious allergic reactions such as dermatitis and hay fever.

Parthenium is recognised as a Weed of National Significance.

Legal requirements

Parthenium is a category 3 restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment. The Act requires everyone to take all reasonable and practical measures to minimise the biosecurity risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.



At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on parthenium. Some of these actions may be required under local laws. Contact your local government for more information.

Description

Parthenium is an annual herb with a deep tap root and an erect stem that becomes woody with age. As it matures, the plant develops many branches in its top half and may eventually reach a height of 2 m.

Its leaves are pale green, deeply lobed and covered with fine soft hairs.

Small creamy white flowers occur on the tips of the numerous stems. Each flower contains four to five black seeds that are wedge-shaped, two millimetres long with two thin, white scales.

Life cycle

Parthenium normally germinates in spring and early summer, produces flowers and seed throughout its life and dies around late autumn. However, with suitable conditions (rain, available moisture, mild temperatures), parthenium can grow and produce flowers at any time of the year. In summer, plants can flower and set seed within four weeks of germination, particularly if stressed.

Methods of spread

Parthenium seeds can spread via water, vehicles, machinery, stock, feral and native animals and in feed and seed. Drought conditions aid the spread of seed with increased movements of stock fodder and transports.

Habitat and distribution

Parthenium is capable of growing in most soil types but becomes most dominant in alkaline, clay loam soils.

The plant is well established in Central Queensland and present in isolated infestations west to Longreach and in northern and southern Queensland.

Infestations have also been found in northern and central parts of New South Wales and it is capable of growing in most states of Australia.

Control

Managing parthenium

The GBO requires a person to take reasonable and practical measures to minimise the biosecurity risks posed by parthenium. This fact sheet provides information and some options for controlling parthenium.

Prevention and weed seed spread

Pastures maintained in good condition, with high levels of grass crown cover, will limit parthenium colonisation. Drought, and the subsequent reduced pasture cover, creates the ideal window of opportunity for parthenium colonisation when good conditions return.

Vehicles and implements passing through parthenium infested areas should be washed down with water. Particular care should be taken with earthmoving

machinery and harvesting equipment. The wash down procedure should be confined to one area, so that plants that establish from dislodged seed can be destroyed before they set seed.

Extreme caution should be taken when moving cattle from infested to clean areas. Avoid movement during wet periods as cattle readily transport seed in muddy soil. On arrival, cattle should be held in yards or small paddocks until seed has dropped from their coats and tails prior to their release into large paddocks. Infestations around yards can be easily spotted and controlled whereas infestations can develop unnoticed in large paddocks.

Particular care should be taken when purchasing seed, hay and other fodder materials. Always keep a close watch for the emergence of parthenium or other weeds on areas where hay has been fed out.

Property hygiene is important. Owners of clean properties should ensure that visitors from infested areas do not drive through their properties. If your property has parthenium on it, ensure that it is not spread beyond the boundary or further within the property.

Manual control

Hand pulling of small areas is not recommended. There is a health hazard from allergic reactions and a danger that mature seeds will drop off and increase the area of infestation.

Pasture management

Grazing management is the most useful method of controlling large-scale parthenium infestations. Maintain pastures in good condition with high levels of ground and grass crown cover. This may require rehabilitation of poor pastures, followed by a sound grazing maintenance program.

Sown pasture establishment—Poor establishment of sown pastures can allow parthenium colonisation.

Pasture agronomy—Aerial seeding prior to scrub pulling is normally beneficial.

Overgrazing—High grazing pressure caused by drought or high stock numbers decreases the vigour and competitiveness of pastures and allows the entry and spread of parthenium. Maintenance of correct stock numbers is most important in controlling parthenium.

Pastures spelling—In situations of serious infestation, pasture spelling is essential for rehabilitation. Total spelling is much more effective than simply reducing the stocking rate. However, overgrazing of the remainder of the property must be avoided.

The most appropriate time for pasture spelling is the spring–summer growing period, with the first 6–8 weeks being particularly important. If the condition of perennial grasses (native or sown) is low, spelling for the entire growing season may be required or introduced grasses may need to be re-sown. Herbicide treatment can hasten the rehabilitation process by removing a generation of parthenium seedlings and allowing grass seedlings to establish without competition. In the presence of parthenium, grass establishment is poor.

Grazing during winter should not increase the parthenium risk. Most tropical grasses are dormant and can tolerate moderate grazing during this period. However, parthenium may germinate and grow at this time.

Fencing—One of the main problems in controlling parthenium is the large paddock size and the variability of country within paddocks. The resulting uneven grazing pressures encourage parthenium to colonise the heavily grazed country. Ideally, similar land types should be fenced as single units. Fencing can be used to great effect to break up large paddocks, allowing more flexible management such as pasture spelling or herbicide application, options not available previously.

Burning—Burning is not promoted as a control strategy for parthenium. However, research suggests that burning for pasture management (e.g. woody weed control) should not result in an increased infestation if the pasture is allowed to recover prior to the resumption of grazing. Stocking of recently burnt areas known or suspected to contain parthenium decreases pasture competition and favours parthenium, ultimately creating a more serious infestation.

Biological control

The combined effects of biological control agents reduced the density and vigour of parthenium and increased grass production.

There are currently a number of insect species and two rust pathogens that have been introduced to control parthenium—a selection of these are outlined below. *Epiblema strenuana* is a moth introduced from Mexico established in all parthenium areas. The moth's larvae feed inside the stem, forming galls that stunt the plant's growth, reduce competitiveness and seed production.

Listronotus setosipennis is a stem-boring weevil from Argentina but is of limited success in reducing parthenium infestations.

Zygogramma bicolorata is a defoliating beetle from Mexico which is highly effective where present. It emerges in late spring and is active until autumn.

Smicronyx lutulentus (Mexico) lays eggs in the flower buds where the larvae feed on the seed heads. *Conotrachelus albocinereus* (stem-galling weevil from Argentina) produces small galls and is still becoming established in Queensland.

Bucculatrix parthenica (leaf mining moth from Mexico) larvae feed on leaves, leaving clear windows in the leaf. *Carmenta ithacae* is a stem boring moth from Mexico which is becoming established at favourable sites in the northern Central Highlands.

Puccinia abrupta var. *partheniicola* is a winter rust from Mexico that infects and damages leaves and stems. It is currently established over a wide area from Clermont south. It requires a night temperature of less than 16°C and 5–6 hours of leaf wetness (dew). Sporadic outbreaks occur where weather conditions are suitable.

Puccinia xanthii var. *parthenii-hysterophorae* is a summer rust from Mexico that weakens the plant by damaging the leaves over the summer growing season. It is currently established and spreading at a number of sites from north of Charters Towers to Injune in the south.

Herbicide control

Non-crop areas

Parthenium should be sprayed early before it can set seed. A close watch should be kept on treated areas for at least two years.

Small and/or isolated infestations should be treated immediately. Herbicide control will involve a knockdown herbicide to kill plants that are present and a residual herbicide to control future germinations. Repeated spraying may be required even within the one growing season to prevent further seed production.

Extensive infestations will require herbicide treatment in conjunction with pasture management. Timing of spraying is critical so that parthenium is removed when plants are small and before seeding has occurred. Grasses should be actively growing and seeding so that they can recolonise the infested area.

Table 1 details the herbicides registered for parthenium control and application rates. All herbicides must be applied strictly in accordance with the directions on the label.

Cropping areas

Controlling parthenium in cropland requires selective herbicide use and/or crop rotations. For further information on parthenium control in crops consult your local biosecurity officer.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland on 13 25 23 or visit biosecurity.qld.gov.au.



Table 1. Herbicides for the control of parthenium

Situation	Herbicide	Rate	Comments
Pastures, rights-of-way and industrial land	2,4-D as amine 625 g/L (e.g. Ken-Amine 625)	320 mL/100 L water	Spot spray Apply to young actively growing plants, ensuring thorough coverage
	2,4-D as amine 700 g/L (e.g. Amicide Advance 700)	285 mL/100 L water	
Non agricultural areas (native pastures), commercial and industrial areas and rights-of-way	Aminopyralid 375 g/kg plus Metsulfuron-methyl 300 g/kg (Stinger)	10 g/100 L water plus wetting agent (consult label)	Spray to thoroughly wet all foliage but not to cause run-off
Fields and fallow, various crops (consult label)	Atrazine 500 g/L (e.g. Kenso Atrazine 500)	3.6–6 L/ha Rate varies with situation (consult label)	Boom spray. Pre and post emergent application Restrictions apply (consult label) Max 3 kg a.i./ha/yr
Roadside and rights-of-way		6 L/ha	Boom spray. Pre and post emergent application Restrictions apply (consult label) Max 3 kg a.i./ha/yr
Fields and fallow and various crops (see label)	Atrazine 900 g/kg (e.g. Atradex WG)	2–3.3 kg/ha Rate varies with situation (consult label)	Boom spray. Pre and post emergent application Restrictions apply (consult label) Max 3 kg a.i./ha/yr
Roadside and rights-of-way		3.3 kg/ha	Boom spray. Pre and post emergent application. Restrictions apply (consult label). Max 3 kg a.i./ha/yr
Non-crop areas, commercial and industrial areas, pastures and rights-of-way	2,4-D 300 g/L + Picloram 75 g/L (e.g. Tordon 75-D)	125 mL/100 L	Spot spray during rosette stage Use at least 3000 L/ha in dense infestations (consult label)
		3 L/ha	Boom spray during rosette stage (consult label)
Native pastures, rights-of-way, commercial and industrial land	Metsulfuron-methyl 600g/L (e.g. Associate)	5 g/100 L water + wetter	Hand gun. Spray to thoroughly wet all foliage but not to cause runoff
		7 g/ha + wetter	Boom spray. For pastures only Treat in rosette stage (consult label)
		5–7 g/h	Boom spray. Lower rate up to 4-leaf stage, higher rate 4-leaf stage to rosette
Wheat, barley, triticale and cereal rye			
Native pastures, rights-of-way, commercial and industrial land	Triclopyr 75 g/L + Metsulfuron-methyl 28 g/L (e.g. Zelam Brush Weed)	125 mL/100 L water	Spot spray plants from rosette to flowering (consult label)
Commercial and industrial areas, rights-of-way, around agricultural buildings	Hexazinone 750 g/kg (e.g. Velpar DF)	1 kg/ha 2 g/10 L/20 m ²	Boom spray or spot spray
Around agricultural buildings		3.5 L/ha or 7 L/10 L/20 m ²	
Grass pastures, fallows, various crop and non-crop situations (consult label)	Dicamba 500 g/L (e.g. Kamba 500) Dicamba 700 g/kg	Rates vary with situation (consult label)	Boom spray or spot spray (consult label)

A number of the listed herbicides are available as different formulations, but some may not be registered for parthenium. Check the label for registration, rate and critical comments. Only use products that list parthenium on the label. The registered rates are for non-crop uses. Consult label for in-crop recommendations. For power hand spray or knapsack use, spray plants to the point of runoff.

Read the label carefully before use. Always use the herbicide in accordance with the directions on the label.

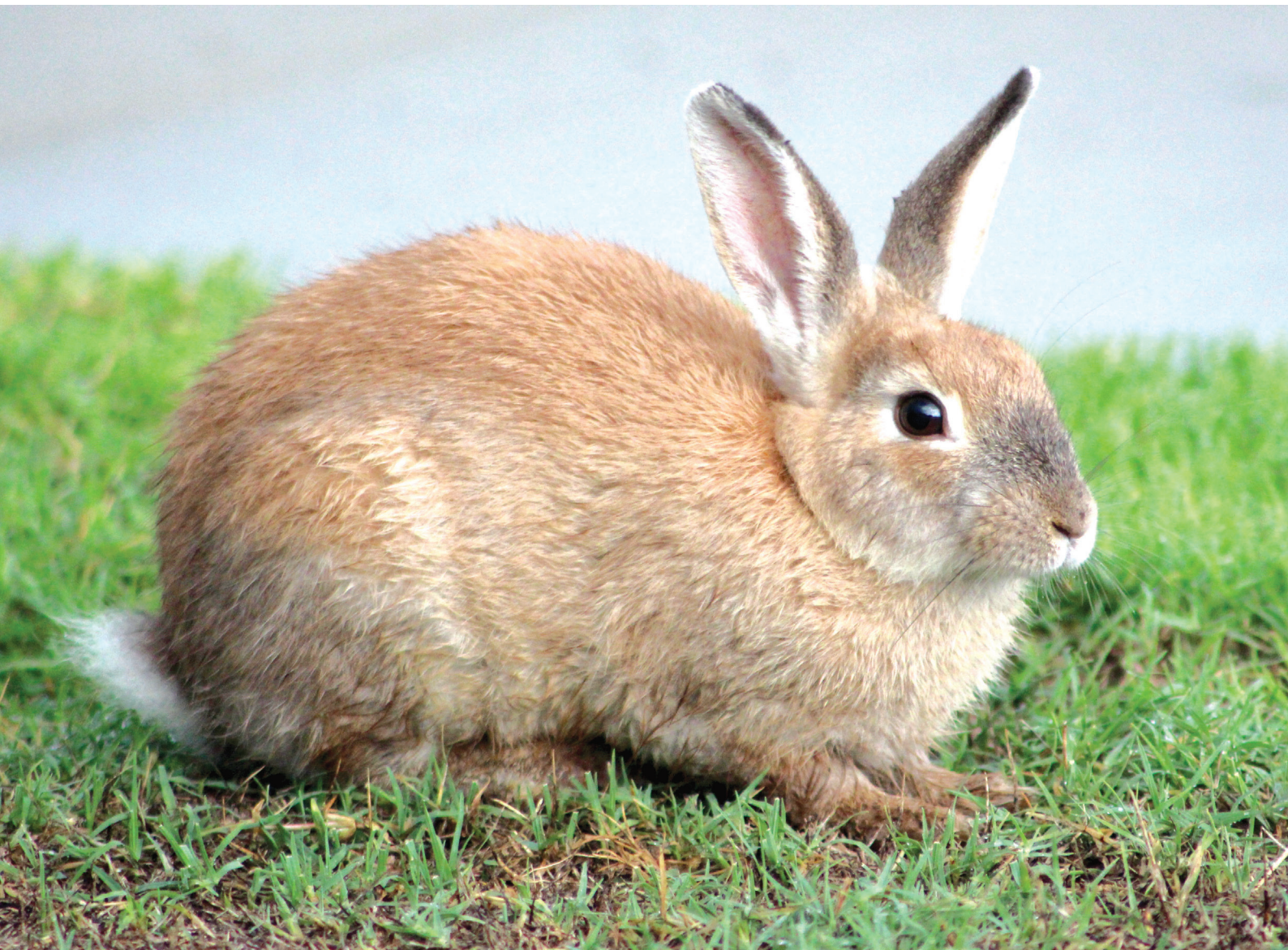


This fact sheet is developed with funding support from the Land Protection Fund.

Fact sheets are available from Department of Agriculture and Fisheries (DAF) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DAF does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

Rabbit

Oryctolagus cuniculus



Rabbits are one of Australia's major agricultural and environmental animal pests, costing the country between \$600 million and \$1 billion annually. They compete with native animals, destroy the landscape and are a primary cause of soil erosion by preventing regeneration of native vegetation.

Legal requirements

The rabbit is a category 3, 4, 5 and 6 restricted invasive animal under the *Biosecurity Act 2014*. It must not be moved, kept, fed, given away, sold, or released into the environment. The Act requires everyone to take all reasonable and practical measures to minimise the biosecurity risks associated with invasive animals under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.



At a local level, each local government must have a biosecurity plan that covers invasive animals in its area. This plan may include actions to be taken on certain species. Some of these actions may be required under local laws. Contact your local government for more information.

Pet rabbits

Introducing and selling rabbits in Queensland is not permitted (penalties apply). Limited numbers of permits for domestic rabbits are only available from Biosecurity Queensland for research purposes, public display, magic acts or circuses. Before a permit is granted, a number of guidelines need to be fulfilled.

Description

Rabbits are small mammals around 34–45 cm in length usually grey brown with pale belly fur, other colours include piebald, black and ginger. They have long ears 10 cm long and big eyes. They have long hind legs with hind feet measuring 9–11 cm and short front legs. The tail is fluffy brown with white underneath, 4–8 cm. Adult rabbits usually weigh around 1–2.1 kg. The male is called a buck, the female a doe and her young are called kittens.

Life cycle

Does (females) are pregnant for 28–30 days, but are able to mate within hours of giving birth. The average litter is 3–4 kittens but varies from two in a young doe, up to eight or more in a mature doe, and depends on the amount and quality of food available.

Five to six litters are possible in a good season. Young does can breed at four months of age if conditions are suitable.

Habitat and distribution

Rabbits prefer to live in warrens as protection against predators and extremes in temperature. However, they will survive in above-ground harbours such as logs, windrows and dense thickets of scrub (e.g. blackberry and lantana) or under built harbour, old sheds and machinery etc.

In newly colonised areas without warrens, rabbits tend to live in 'scrapes' (or 'squats').

Rabbits are adaptable and sometimes live in close association with people. They live in built environments such as:

- in and under buildings
- old machinery and storage containers
- in old dumps.

In rural environments rabbits frequently live in:

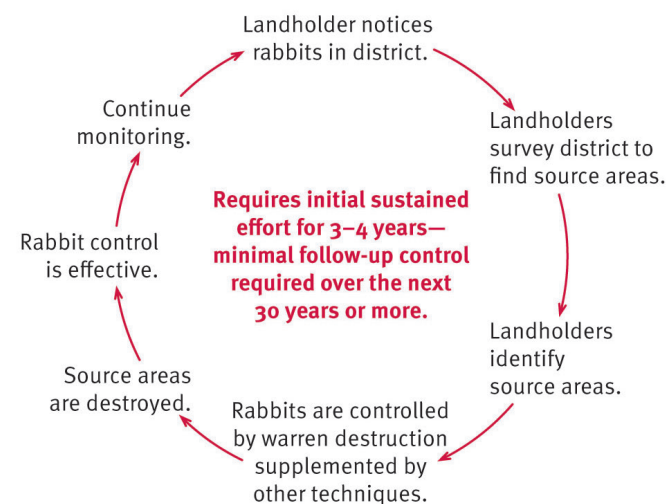
- felled timber and associated windrows
- tussock grasses and rocky areas
- warrens (if soils are easy to dig).

Control

Managing rabbits

The GBO requires a person to take reasonable and practical measures to minimise the biosecurity risks posed by rabbits. This factsheet information and some options for controlling rabbits.

Rabbit control is best done as a joint exercise involving all land managers in the district. Integrated control methods, such as fumigating, ripping warrens and harbour destruction, are essential for the continued long-term reduction of rabbit numbers. Cost-effective, long-term results can be achieved in rabbit control by following a combination of the methods outlined below.



Effective rabbit control cycle

Prevention and early detection

Rabbits will generally eat around 15% of their body weight per day—approximately 250 g. This compares dramatically with the averages for stock—sheep and cattle eat around 3% of their body weight per day. So even a low number of rabbits can be removing large amounts of livestock feed.

For effective long-term rabbit control, concentrate on destroying source areas. Source areas will all have well-established warrens or ready-made structures that are cool and provide protection from predators. A source area must also have a good supply of green feed during the cooler seasons.

Manual control

Harbour destruction

Where there is abundant surface harbour, a high proportion of rabbits may live above ground rather than in underground warrens. Rabbits can make their homes in windrows, dense thickets of shrubs (such as blackberries and lantana) and even in old machinery.

To eliminate these above-ground breeding areas, it may be necessary to:

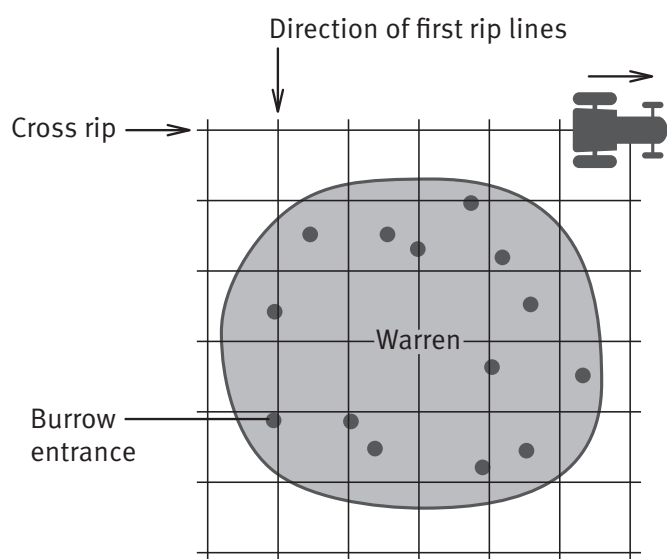
- burn windrows and log piles
- remove noxious weeds through chemical and physical control
- remove movable objects (such as old machinery) from paddocks.

Sometimes removing harbour can expose warrens underneath. If this happens, the warrens need to be ripped.

Mechanical control

Warren ripping

In areas where rabbits live in warrens, ripping is the most effective method of long-term control. Ripping is so successful because warrens can rarely be reopened and rabbits are unable to recolonise these areas.



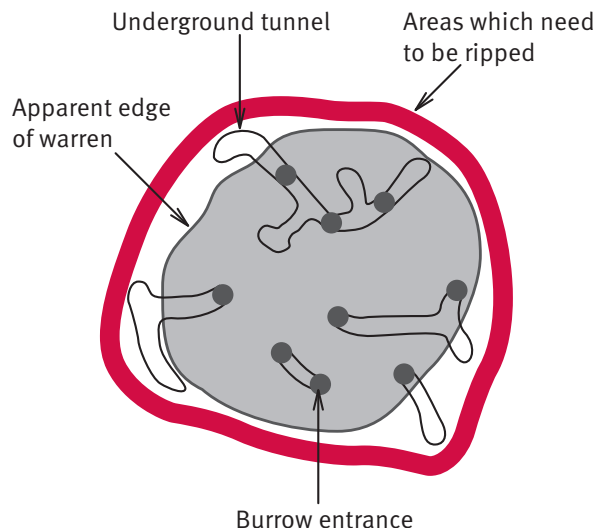
Direction to rip warrens (illustration courtesy Will Dobbie)



Tyne for ripping warrens (photo courtesy Mark Ridge)

To get the best results it is important to chase as many of the rabbits inside the warren as possible. Dogs can be used to drive rabbits into the warren before ripping starts.

The aim of ripping is to completely destroy the warren. It involves using a tractor with a tynd (sharp-pronged) implement—one tyne or many—that rips through the warren and collapses it. Larger tractors and dozers are more appropriate for properties with many warrens as they are able to move faster and rip wider.



Extent to rip warrens (illustration courtesy Will Dobbie)

Obviously, ripping is not suitable for warrens located underneath buildings or on steep rocky country. In such cases, other methods (poison baiting, releasing virus or fumigating burrows) should instead be used to reduce rabbit numbers. Warrens should then be either filled in or covered to stop rabbits from re-establishing. Burrows can be blocked with small boulders or rocks.



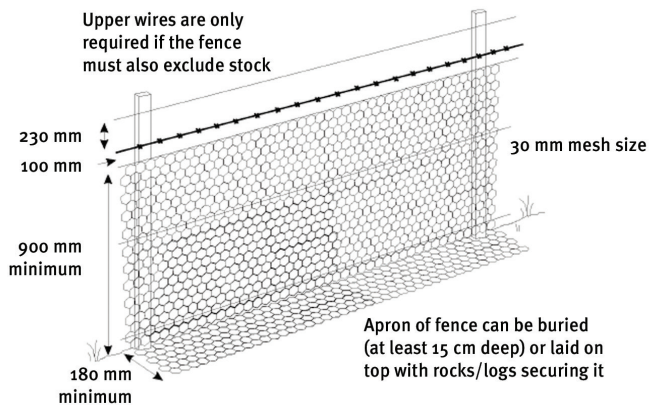
Rock blocking rabbit hole

Exclusion fencing

Rabbit exclusion fences are built with the aim of keeping rabbits out of a particular area. It is appropriate for small, high-value areas that require protection. A fully fenced area will only remain rabbit-free in the long term if all rabbits are removed from the enclosed area after fencing and the fence is regularly maintained and checked for holes.

Electric fencing is a cheaper alternative, but it is not a complete physical barrier and is also prone to damage from other pest animals and stock.

A rabbit-proof fence should be made of wire mesh netting (40 mm or smaller) and needs to be at least 900 mm high. The netting should also be buried to depth of at least 150 mm. Gates into the fenced area need to be rabbit-proof as well.



Exclusion fence for rabbits (illustration courtesy DEWHA)

Trapping

Trapping is an extremely labour-intensive control method and requires a skilled operator to set the traps to successfully capture rabbits.

If you do plan to trap rabbits on your property, common sense and respect for animal welfare are essential. While there are currently no strict guidelines for the use of traps in Queensland, it is an area of growing concern for animal welfare advocates.

Cage trap

A cage trap has a lever that closes the cage when a rabbit steps on it. The rabbits are lured into the cage with bait—usually diced carrot. Traps need to be disabled and left open for two or three nights with bait leading into the cage. This entices rabbits to enter. A trap can be set once a rabbit has consumed a trail of bait all the way into that trap. Traps should be checked and emptied regularly—usually a couple of times a night.

This effective and humane technique is most useful for removing any remaining rabbits from places like hay sheds and after the shed has been fenced to prevent additional rabbits from entering and leaving. Free-feed then trap, and keep the shed rabbit-proof to prevent rabbits recolonising.

Barrel trap

A barrel trap is designed specifically for rabbits. It is cylindrical, made of light mesh, and is about 1 m long and 15 cm in diameter. The trap has one open end with two hinged trap doors along its side. The open end is placed in the burrow, and the hinged gates close and trap the rabbit after it enters from the burrow.

The trap can be left in the burrow entrance for a number of days. However, it must be checked at least daily so that if a rabbit has been caught it does not suffer and animal welfare responsibilities are met.



Barrel rabbit trap in hole

Biological controls

Rabbit hemorrhagic disease virus (also known as rabbit calicivirus disease)

RHDV is a virus specific to rabbits which works by infecting the lining of the throat, lungs, gut and liver.

RHDV relies primarily on direct rabbit-to-rabbit contact in order to spread. High rabbit numbers are therefore needed before this control method will be effective.

After RHDV has infected an area, it is important to use another method for follow-up control to increase the likelihood that the population is eradicated before it is able to develop resistance and increase its numbers again.

Resistance to RHDV depends primarily on the age of the rabbit. Therefore, it is better for RHDV to go through a rabbit population after rabbits have bred and the young are old enough to be affected by the virus. Rabbits that survive RHDV develop antibodies against the virus. Breeding females can also pass these antibodies on to the young (through antibodies in their milk), conferring temporary protection on rabbits up to 12 weeks old.

Myxomatosis

Myxomatosis is no longer produced as a laboratory strain but field strains are still known to recur and affect rabbit populations.

RHDV1-K5

Recent research by state and federal agencies has identified a new strain of RHDV (called RHDV-K5) that will aid in controlling rabbits that have immunity to current strains.

Shooting

Shooting is most useful when used for removal after other control methods (such as ripping). To get the best results, shoot at the time of day when rabbits are active. This is usually in the early morning, late afternoon or at night. The best and most economical firearm to use is a .22 calibre rifle.

If your property is within an urban area, you will need to comply with local government regulations and the *Police Powers and Responsibilities Act 2000*, which restrict the use of firearms.

Poison baiting

Baiting is not effective as a sole control method and will not eradicate an entire rabbit population. Numbers will quickly increase again, and you will have to continue baiting year after year with no permanent overall change in the rabbit population.

Rabbits can also become 'bait shy' and this method becomes less and less effective over time. Ideally, baiting is best used either before ripping/fumigation to reduce a population, or after ripping/fumigation for removal.

Baiting works best when rabbits are not breeding. During breeding season the majority of the population feeds over a larger-than-normal area, and it is the young rabbits that are most likely to take baits. While numbers will be reduced, animals of breeding age are not likely to be affected.

1080—sodium fluoroacetate

Pre-feeding is required when using 1080 because rabbits will not readily take new feed. The poison-free bait should be laid at least three times over a one-week period before the poisoned bait is laid. (1080-impregnated carrot baits are the most common form of bait used.) The practice helps to ensure that, when the poisoned bait is laid, it will be eaten by most of the rabbit population.

1080 can only be supplied through persons authorised under the Health Act. Your local Biosecurity officer or your local government office should be able to assist you.

Pindone

Pindone is an anticoagulant registered for rabbit control. This poison works by preventing blood from clotting. In Queensland, it is not recommended for broadacre use and is mainly used in urban areas and near farm buildings.

Pindone works best when given as a series of small doses/feeds over a period of three days. Although pre-feeding is not essential, it does enhance the bait uptake by shy rabbits as they get used to the feed prior to any poison bait being laid. To be effective, pindone requires multiple feeds so that the poison can build up to fatal levels in the rabbit's body. Feeding over a number of nights provides plenty of opportunity for most of the rabbit population to consume the required lethal dose. Rabbits poisoned with pindone will usually die within 10–20 days.

Pindone baiting does not work well when there is a lot of green pick around for rabbits.

Poison bait trails

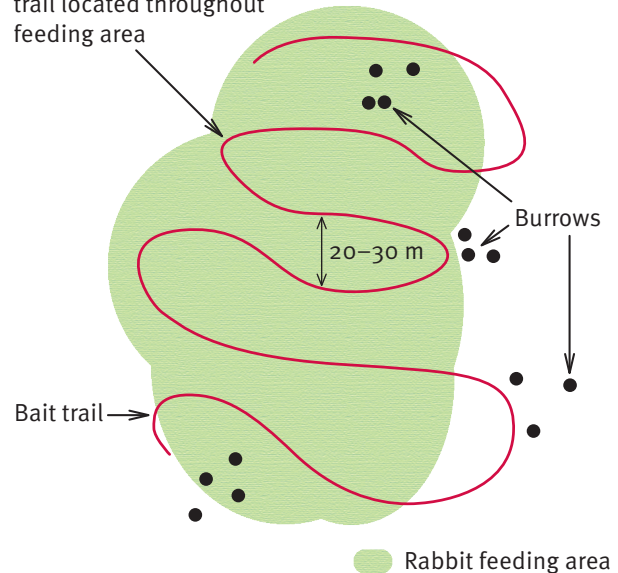
It is important that bait trails are laid properly to ensure the best results. 'Baitlayers' make it easier to put out bait trails at the correct rate, and they can be towed behind most 4WD vehicles, quad bikes and tractors.

When scratching and laying a trail, consider the following:

- Rabbits like freshly scratched/disturbed soil—this may be because rabbits are territorial and inspect newly disturbed soil, and/or the disturbed vegetation smell attracts them.
- Lay trails around warrens and in the areas where rabbits most often feed.
- Laying trails on slopes and hills requires care—it can cause erosion in some soils types (e.g. granite and traprock). Trails are best laid in a zigzag pattern in steep terrain to minimise erosion.
- A trail that has been scratched for the first feed is easy to follow for the rest of the baiting program.
- The soil should be turned only enough to scratch the surface—don't plough the ground.
- A trail that has been scratched too deep will spook the rabbits because they will not have full sight of their predators.
- Where vegetation is thick, or it is difficult to find the main feeding areas, lay bait trails in a grid pattern across the site.

As a general rule, avoid crossing the bait trail—it can cause confusion when you try to follow the same trail on subsequent occasions.

Free-feed and poison feed trail located throughout feeding area



Method for laying a bait trail (illustration courtesy Animal Control Technologies)

Bait trials will be most effective if you follow these guidelines:

- use good quality, non-contaminated bait material. (Simple rule: if you wouldn't eat it, the rabbit won't either)
- use enough feed to bait all the rabbits in the area. (The pre-feed will give an indication of the potential bait take)
- expect a greater uptake of pre-feed and bait material when vegetation is scarce, dried off or soured
- ensure that all the preparation equipment is clean and free of any chemical residues or smells—rabbits can be very shy of unusual odours
- when there are kittens in a warren, lay the bait trail close to the warrens.

Fumigation

Fumigation is labour intensive and time consuming, and is not usually an effective method if used alone. However, as a removal technique or control method for use in areas where ripping is not practical (e.g. steep and rocky terrain), it may be a good alternative.

Because this technique relies on directly affecting the rabbits, and does not affect the structure of the warren, it is crucial that as many rabbits as possible are underground when fumigation is carried out. Rabbits usually take refuge in their burrows from mid-morning to mid-afternoon and during hot weather so these are the best times to fumigate. Dogs can also be used to drive rabbits into their warrens.

For best results, fumigation should be carried out in two stages—initially, before the breeding season starts (as this reduces the breeding stock), and then again during the breeding season.

There are two types of warren fumigation—static and pressure. In Queensland, static fumigants are a more popular and safer option for controlling rabbits and will be explained below.