



Parthenium weed

Parthenium hysterophorus

DECLARED CLASS 2



Description

Parthenium weed 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 two metres. 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.

The problem

Parthenium weed 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 weed can also colonise brigalow, gidgee and softwood scrub soils. Its presence reduces the reliability of improved pasture establishment and reduces pasture production potential. In 1992, it was estimated that parthenium weed cost the beef industry \$16.5 million per year, including reduced beef production and control costs. Parthenium weed costs cropping industries several million dollars per year also.

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

Life cycle

Parthenium weed normally germinates in spring and early summer, produces flowers and seed throughout its life and dies around late autumn. However, with suitable conditions (germinating rain, available moisture, mild soil and air temperatures), parthenium weed 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.

Where does it occur?

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

Parthenium weed is a native of subtropical areas in South and North America and was initially recorded at Toogoolawah in 1955. A second introduction occurred north of Clermont in 1960. Unfortunately its early establishment was ignored. The plant is now 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.

Declaration details

Parthenium weed is a declared Class 2 plant under *Land Protection (Pest and Stock Route Management) Act 2002*. Declaration requires landholders to control declared pests on the land and waters under their control. A local government may serve a notice upon a landholder requiring control of declared pests.

Prevention and spread

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

As with most weeds, prevention is much cheaper and easier than cure. 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.

Vehicles and implements passing through parthenium weed infested areas should be washed down with water. Washdown facilities are located in Alpha, Biloela, Charters Towers, Emerald, Gracemere, Injune, Monto, Moura, Rolleston, Springsure and Taroom. Particular care should be taken with earthmoving machinery and harvesting equipment. The wash down procedure should be confined to only one area, so that any 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 on areas where hay has been fed out for the emergence of parthenium or other weeds.

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 weed on it, ensure that it is not spread beyond the boundary or further within the property.

Control

Control of parthenium weed infestations should revolve around pasture management, biological control and timely herbicide treatment.

Pasture management

Grazing management is the most useful method of controlling large-scale parthenium weed 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 weed colonisation. Contact your local Department of Primary Industries and Fisheries Pasture Agronomist for species selection and sowing guidelines to suit your particular situation. 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 weed. Maintenance of correct stock numbers is most important in controlling parthenium weed. For more information on stocking rates for your situation consult a Department of Primary Industries and Fisheries Pasture Agronomist.

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 also 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 very low, spelling for the entire growing season may be required or introduced grasses may need to be resown. 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 weed, grass establishment is poor.

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

Fencing

One of the main problems in controlling parthenium weed is the large paddock size and the variability of country within paddocks. The resulting uneven grazing pressures encourage parthenium weed 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 weed. 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.

For more information on using fire for pasture management consult a Department of Primary Industries and Fisheries Pasture Agronomist.

Herbicide control

Non-crop areas

Parthenium weed 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 weed 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 shows the herbicides registered for parthenium weed control and application rates. Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the directions on the label.

Cropping areas

Controlling parthenium weed in cropland requires selective herbicide use and/or crop rotations. For further information on parthenium weed control in crops consult your nearest Department of Primary Industries and Fisheries Extension Agronomist.

Biological control

So far, nine species of insect and two rust pathogens have been introduced to control parthenium weed. The moth *Epiblema strenuana* (introduced from Mexico) is established in all parthenium weed areas. The moth's larvae feed inside the stem, forming galls which stunt the plant's growth, reduce competitiveness and seed production. *Listronotus setosipennis* (stem-boring weevil from Argentina) is having limited success in reducing the vigour of parthenium weed infestations. *Zygogramma bicolorata* (defoliating beetle from Mexico) 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. *Carmenia ithacae* (stem boring moth from Mexico) was released from quarantine in 1999 and is becoming established at favourable sites in the northern Central Highlands.

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

Puccinia melampodii (summer rust from Mexico) weakens the plant by damaging the leaves over the summer growing season. It is established and spreading at a number of sites from north of Charters Towers to Injune in the south.

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

Manual control

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

Further information

Further information is available from the vegetation management/weed control/environmental staff at your local government.

TABLE 1 – HERBICIDES REGISTERED FOR PARTHENIUM WEED

Herbicide	Rate	Situation	Comments	
2,4-D amine 500 g/L	0.4 L/100 L	Land—industrial, pastures; rights-of-way	Spot spray	
atrazine 500 g/L	3.6–6 L/ha	Fields and fallow	Boom spray	
max 3 kg/ha/yr	6 L/ha	Land—industrial, commercial, non-agricultural, roadside, right-of-way	Boom spray	
atrazine 900 g/kg	2– 3.3 kg/ha	Fields and fallow	Boom spray	
max 3kg/ha/yr	3.3 kg/ha	Land—non-agricultural, commercial, industrial	Boom spray	
2,4-D + picloram (Tordon 75-D)	125 mL/100 L	Land—commercial, industrial, pastures, right-of-way	Spot spray	
	3 L/ha	Land—commercial, industrial, pastures, right-of-way	Boom spray	
2,4-D ester ¹	.025 L/10 L	Land—non-agricultural, pastures	Rosette stage	
glyphosate (450g/L)	0.8–1.2 L/ha	Fields and fallow	Spot spray	
metsulfuron methyl	5– 7g/ha	Fields and fallow	Seedlings only	
	5 g/100 L	Land—commercial, industrial, pastures, rights-of-way	Spot spray	
hexazinone	3.5 L/ha or 7 L/10 L/20 m ²	Land—commercial, industrial, pastures, rights-of-way	Boom spray or spot spray	
dicamba (200g/L)	0.7–2.8 L/ha or 0.1– 0.19 L/100L	Grass pastures	Boom spray or spot spray	
	(500 g/L)	0.28–1.1 L/ha or 0.40–0.76 L/100L	Grass pastures	Boom spray or spot spray
	(700 g/kg)	200–800 g/ha or 30– 60 g/100 L	Grass pastures	Boom spray or spot spray

Further information on the selection of suitable herbicides for your situation can be obtained from the Department of Natural Resources and Water, local governments and the Parthenium Action Group.

¹Use restricted in some areas of Central Qld

Notes – 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. ■

Fact sheets are available from NRW service centres and the NRW Information Centre phone (07 3237 1435). Check our web site <www.nrw.qld.gov.au> to ensure you have the latest version of this fact sheet. The control methods referred to in this Pest Fact 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 utilisation 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, the Department of Natural Resources and Water does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

© The State of Queensland (Department of Natural Resources and Water) 2006