Parthenium weed

Parthenium hysterophorus

PROHIBITED MATTER: If you see this plant report it. Call the NSW DPI Biosecurity Helpline 1800 680 244

Parthenium weed (Photo: Bob Trounce)

- This plant is a Weed of National Significance
- This plant must not be sold anywhere in NSW

Profile

How does this weed affect you?

Parthenium weed grows quickly. It outcompetes other plants by competing for nutrients and moisture and by releasing chemicals into the soil that inhibit growth. Parthenium weed:

- causes human health problems
- is unpalatable to stock

- outcompetes degraded or drought affected pastures
- reduces carrying capacity
- causes livestock health problems
- competes with crop seedlings including sunflowers and sorghum
- reduces crop yields
- contaminates grain
- is a host for crop viruses.

Human health

Parthenium weed can cause respiratory problems and severe dermatitis.

Never touch the plant with bare hands**.** Use a dust mask if working near the weed.

People might not have an allergic reaction the first time they touch a plant. Allergies can develop after a few exposures. Once a reaction to parthenium weed develops, some people go on to develop allergies to related plants such as sunflowers. This reaction can be so severe that people with the allergy may need to move away from parthenium weed infested areas.

Livestock health

Livestock do not usually eat parthenium weed but if no other feed is available, they may eat large amounts. This can cause kidney damage in ruminants (cattle, sheep and goats). Young cattle are most susceptible to dying from parthenium poisoning.

Animals may also have allergic reactions including dermatitis.

If livestock (especially sheep) eat parthenium weed within one month of slaughter it can taint the flavour of meat. It can also taint milk.

What does it look like?

Parthenium weed is an erect annual herb that usually grows around 1–1.5m tall but can grow to 2 m tall.

Leaves are:

- pale green
- lower leaves are 5–20 cm long and deeply divided
- upper leaves less divided and smaller
- covered with soft, fine hair
- alternate on the stem.

Most leaves die after the plant flowers.

Flowers are:

- creamy-white
- 4–6 mm in diameter
- star shaped with 5 distinct points
- made up of many tiny florets:
    - each of the 5 points is a ray floret with petals
    - the centre has many (12-60) tiny tubular disc florets
- at the end of stems in clusters that look a bit like ‘baby’s breath’.

Seeds are:

- dark brown–black
- 1-2 mm across
- flattened
- triangular with two thin, white, spoon-shaped appendages.

Stems are:

- grooved or ribbed, making stems look striped
- woody with age
- highly branched off the upper half of the main stem during flowering.

Roots are:

- a deep taproot.

Similar looking plants

Prior to flowering, parthenium weed looks like:

- annual ragweed (*Ambrosia artemisiifolia*), which has round stems whereas parthenium weed has ridged or grooved stems.
- greater beggar's ticks (*Bidens subalternans*), which has individual leaflets, whereas the leaves of parthenium weed are deeply divided.

During flowering, parthenium weed looks like:

- bishop's weed (*Ammi majus)*
- hemlock *(Conium maculatum*).

You can tell them apart by the mature flowers. Hemlock and bishop's weed flowers have larger, distinct petals.

After it has set seed and becomes woody, parthenium weed looks like fleabane (*Conyza spp*). Fleabane has straw-coloured seeds and the fluffy flowers do not have five lobes.

Where is it found?

Parthenium weed does not have established populations in NSW. Previous infestations have been eradicated.

It is widespread in central Queensland.

Conditions are ideal for parthenium weed in most areas of NSW except for very arid or wet areas.

In NSW it has been found:

- along roadsides, particularly along the Newell Highway
- farming properties in the North West, Central West, South East, North Coast and Hunter regions
- in urban areas and rural prperties in the Greater Sydney region.

Parthenium weed is native to the Caribbean, southern USA and central America. It was introduced to central Queensland in the 1950's in contaminated pasture seed from Texas USA.

What type of environment does it grow in?

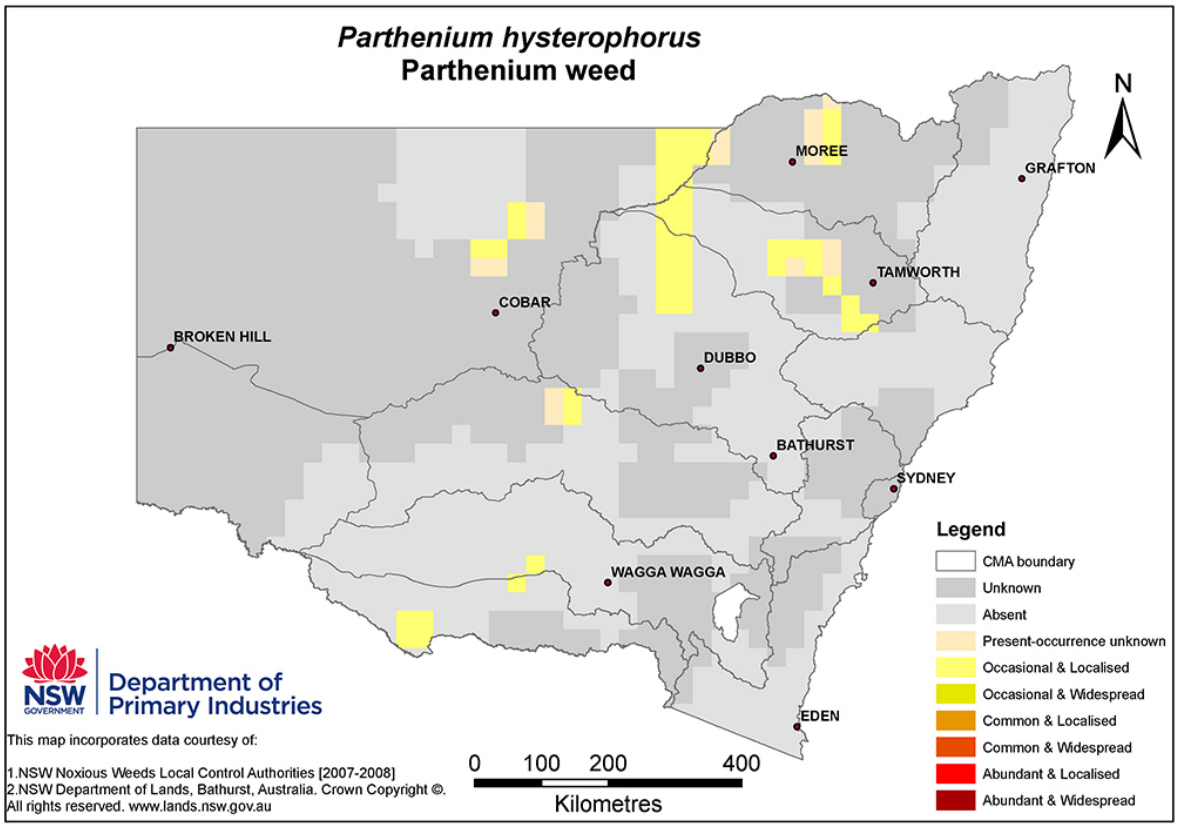
Parthenium weed tolerates a variety of conditions and soil types.

It grows best in areas with:

- alkaline clay-loam to heavy black clay soils
- at least 500 mm of summer rain
- disturbed, degraded or bare soil sites.

Once established, plants will survive droughts and frosts. It will not grow in very arid or wet areas.

Distribution map



How does it spread?

By seed

Parthenium weed spreads by seeds. Seeds close to the soil surface will germinate readily. Buried seeds can remain dormant for many years. Parthenium weed:

- can germinate, flower, and set seed in four weeks (in favourable conditions)
- produces seeds continuously over a full summer season until it dies
- produces up to 15,000 seeds each year per plant (dense infestations can produce up to 700 million seeds per hectare).

Seeds are introduced into NSW mainly on or in:

- harvesting machinery
- hay and grain
- heavy vehicles that have picked up mud in Queensland
- vehicles and machinery from infested areas of Queensland.

Seeds can also be moved in contaminated soil, potting mix or compost.

When an infestation is established the seed is spread locally along waterways, in flood waters and by animals and whirlwinds.

References

Adkins, S., & Shabbir, A. (2014). Biology, ecology and management of the invasive parthenium weed (Parthenium hysterophorus L.). *Pest management science*, *70*(7), 1023-1029.

NSW Department of Primary Industries. *Parthenium Primefact* 707

Parsons, W. T., & Cuthbertson, E. G. (2001). *Noxious weeds of Australia.* (2nd edition).CSIRO publishing.

PlantNET (The NSW Plant Information Network System). *Parthenium hysterophorus* L.. Royal Botanic Gardens and Domain Trust, Sydney. Retrieved from 26 March 2020 from: http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&showsyn=&dist=&constat=&lvl=sp&name=Parthenium~hysterophorus

More information

- NSW Parthenium Strategy (http://www.dpi.nsw.gov.au/biosecurity/weeds/strategy/strategies/nsw-parthenium-strategy)
- Header and agricultural machinery hygiene for parthenium weed (https://www.dpi.nsw.gov.au/biosecurity/weeds/parthenium-greatest-threat)
- Where parthenium weed could grow in Australia - current and future maps (http://www.weedfutures.net/species.php?id=1156)
- PlantNET NSW FloraOnline, Parthenium hysterophorus. Royal Botanical Gardens and Domain Trust. (https://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Parthenium~hysterophorus)
- Parthenium weed models by Rachel Klyve (www.rachelklyve.com) (https://sketchfab.com/playlists/embed?collection=e3480b2941e04157867f4aa20a4a32e2&autostart=0)

Control

Please do not attempt to treat or dispose of this weed yourself. Report this plant if you see it anywhere in NSW by calling the helpline listed at the top of this page immediately.

NSW DPI will lead an initial response for the treatment and disposal of the plant to stop it from spreading.

Prevention

Cleaning vehicles and machinery

Compulsory inspections of harvesting machinery entering NSW from Queensland ensure that machinery is clean. Vehicles and equipment coming from infested areas of Queensland should also be cleaned before coming into NSW. This reduces the risk of introducing Parthenium weed.

Checking for plants

Check high-risk sites where Parthenium weed might establish. These are places with disturbed, degraded or bare soil such as:

- overgrazed, heavily-stocked areas
- stockyards and watering points
- along roadsides and fence lines
- neglected areas
- cropping paddocks recently harvested by contract harvesters
- areas where excavation or mineral exploration machinery has been working.

Also check for it where:

- new soil or compost has been delivered
- hay, grain or bird seed has been fed to livestock (including chickens).

Chemical control

Spot and boom spraying are used to control this weed.

Biological control

Currently the aim is to eradicate all parthenium weed in NSW, so there is no need to release biocontrol agents (which only help to contain weeds). In Queensland five biological control agents have established but they do not effectively control the weed.

Herbicide options

WARNING - ALWAYS READ THE LABEL
Users of agricultural or veterinary chemical products must always read the label and any permit, before using the product, and strictly comply with the directions on the label and the conditions of any permit. Users are not absolved from compliance with the directions on the label or the conditions of the permit by reason of any statement made or not made in this information. To view permits or product labels go to the Australian Pesticides and Veterinary Medicines Authority website www.apvma.gov.au

See Using herbicides (http://www.dpi.nsw.gov.au/biosecurity/weeds/weed-control) for more information.

2,4-D 300 g/L + Picloram 75 g/L (Tordon® 75-D)
Rate: 125 mL per 100 L of water
Comments: Spot spray. Rosette stage when plants are actively growing.
Withholding period: 1-8 weeks (see label).
Herbicide group: I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: Moderate

2,4-D 300 g/L + Picloram 75 g/L (Tordon® 75-D)
Rate: 3.0 L/ha
Comments: Boom application.
Withholding period: 1-8 weeks (see label).
Herbicide group: I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: Moderate

Atrazine 900 g/kg (Various products)
Rate: 3.3 L/ha
Comments: Protects against emerging seedlings.
Withholding period: 28 days.
Herbicide group: C, Inhibitors of photosynthesis at photosystem II (PS II inhibitors)
Resistance risk: Moderate

Dicamba 500 g/L (Various products)
Rate: 40 mL per 100 L of water
Comments: Spot spray.
Withholding period: 7 days.
Herbicide group: I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: Moderate

Dicamba 500 g/L (Various products)
Rate: 600 mL/ha
Comments: Boom spray. Apply to young, actively growing plants.
Withholding period: 7 days.
Herbicide group: I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: Moderate

Hexazinone 250 g/L (Velpar® L)
Rate: 70 mL per 100 L of water
Comments: Apply uniformly over the area. When spraying single plants treat soil for 1 m around. Do not use near desirable trees.
Withholding period: No stated withholding period.
Herbicide group: C, Inhibitors of photosynthesis at photosystem II (PS II inhibitors)
Resistance risk: Moderate

Metsulfuron-methyl 300 g/kg + Aminopyralid 375 g/kg (Stinger™)
Rate: 10 g per 100 L of water
Comments: Hand gun application.
Withholding period: 3 - 56 days (see label)
Herbicide group: B, Inhibitors of acetolactate synthase (ALS inhibitors) + I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: High/Moderate

Metsulfuron-methyl 600 g/kg (Various products)
Rate: 5 g per 100 L of water
Comments: Thoroughly wet all foliage to the point of run-off.
Withholding period: Nil (recommended not to graze for 7 days before treatment and for 7 days after treatment to allow adequate chemical uptake in target weeds).
Herbicide group: B, Inhibitors of acetolactate synthase (ALS inhibitors)
Resistance risk: High

Biosecurity duty

The content provided here is for information purposes only and is taken from the *Biosecurity Act 2015* and its subordinate legislation, and the Regional Strategic Weed Management Plans (published by each Local Land Services region in NSW). It describes the state and regional priorities for weeds in New South Wales, Australia.

Area	Duty
All of NSW	**General Biosecurity Duty** *All plants are regulated with a **general biosecurity duty** to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*
All of NSW	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
All of NSW	**Prohibition on certain dealings** *The following equipment must not be imported into NSW from Queensland: grain harvesters (including the comb or front), comb trailers (including the comb or front), bins used for holding grain during harvest operations, augers or similar for moving grain, vehicles used to transport grain harvesters, support vehicles driven in paddocks during harvest operations, mineral exploration drilling rigs and vehicles used to transport those rigs, unless set out as an exception in Division 5, Part 2 of the Biosecurity Order (Permitted Activities) 2017*

Parthenium weed has fern-like leaves. (Photo: J Gasparotto)

Parthenium weed at 6 leaf stage. (Photo: J.J. Dellow)

Parthenium weed seedling (Photo: NSW DPI)

Parthenium weed infestation in a sorghum crop. (Photo: Philip Blackmore NSW DPI)

Parthenium weed plants can flower when they are only 4 weeks old. (Photo: Sheldon Navie NSW Government)

Parthenium weed can produce flowers when the plants are very small (Photo: Ian Schwartz)

Parthenium weed flowers have five points. (Photo: Linda Brown Sutherland Shire Council)

Parthenium weed plant (Photo: Auld and Medd)

Parthenium weed can grow on a wide variety of soil types. (Photo: Larry K. Allain)

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