Scotch broom

Cytisus scoparius subsp. *scoparius*

Scotch broom pods have hairy margins and are green at first. The flowers are bright yellow and pea-like. (Photo: John Hosking.)

- Also known as: English broom
- This plant is a Weed of National Significance
- This plant must not be sold anywhere in NSW

Profile

How does this weed affect you?

Scotch broom will smother desirable vegetation which reduces pasture stocking rates. They form dense thickets which can block access by humans and stock but harbour feral animals such as rabbits, foxes and pigs.

Toxicity

Scotch broom is toxic to humans and will cause discomfort and irritation, but is not life-threatening. The seeds and leaves are poisonous and can cause high blood pressure and nausea if ingested. If ingested in

large amounts the toxins contained in scotch broom can weaken the heart.

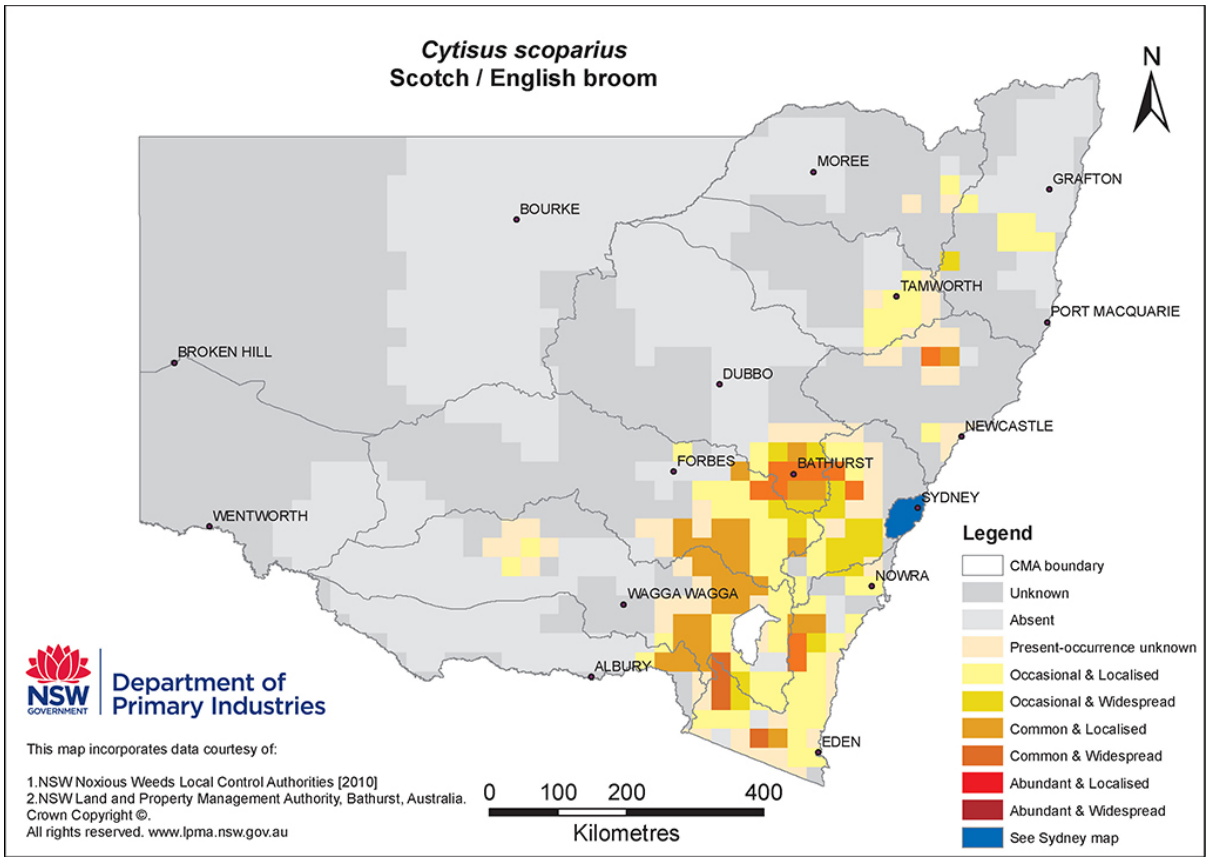
What to do if poisoning occurs:

- If the patient is unconscious, unresponsive or having difficulty breathing **dial 000** or get to the emergency section of a hospital immediately.
- If the patient is conscious and responsive call the **Poisons Information Centre** on **13 11 26** or your doctor.
- If going to a hospital take a piece of the plant for identification.

Where is it found?

Gorse and brooms are mostly confined to cool temperate areas of NSW, particularly the tablelands. Gorse is a problem in the south-eastern region of the state and the Blue Mountains. Some large populations of Scotch broom exist on the Barrington Tops and near Braidwood.

Distribution map



How does it spread?

Originally, both gorse and brooms were planted as hedge or ornamental garden plants. Their main method of spread is now via seed by soil, water, machinery, footwear, stock and wildlife. The ability of the plants to shoot their seeds some metres away allows infestations to thicken quickly and to spread, particularly along water courses. Their pods burst open in hot weather during spring and summer, scattering seeds up to several metres from the plant. Seeds of these species have a hard coat that can delay germination for months or years, allowing large seed banks to develop. Seed can remain viable in the soil for many years.

Plants are normally at least two years of age before they are able to reproduce. Flowering mostly occurs from late winter to late spring. A second flowering may occur towards the end of summer and into autumn. Occasional flowers may be seen at other times.

Although germination and seedling establishment do occur annually, it is common for significant germination and survival events to occur in years following fire or soil disturbance.

What does it look like?

Scotch broom is an upright, evergreen shrub that grows to 4 m high but more commonly 1–2 m high. There are other species in this family that are similar in appearance and can be difficult to tell apart from the species covered here, such as flax-leaf broom (*Genista linifolia*) and Madeira broom (*Genista stenopetala*).

Hybrids between the different species may also exist. Brooms are characterised by a long seed life, seedlings that take two or more years to grow to seed producing shrubs, and adult shrubs that may live for several decades.

Its upper stems usually with five pronounced ridges and woody with numerous branches.

Leaves are shortly stalked, softly hairy with three leaflets per leaf. The middle leaflet is up to 20 mm long, other leaves are somewhat shorter.

The flowers are yellow and pea-like. They are 2 – 2.5 cm long, occuring singly or in pairs,

Brown to black pea-like pods have hairs that are confined to margins. Each pod is up to 7 cm long and 1.3 cm wide, it contains 5 - 22 seeds.

The seeds are yellowish-brown in colour to olive green. Oval shaped up to 4 mm long. They are smooth, rounded and slightly flattened.

What type of environment does it grow in?

Scotch brooms often become dense on river banks, forest margins, roadsides and other disturbed areas. They will also invade pastures and native vegetation. They are able to grow on a wide range of soil types and are able to flourish in areas with an annual rainfall over 500mm.

Acknowledgements

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More information

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- Weed futures: Determining current and future weed threats in Australia, Cytisus scoparius subsp. scoparius . Macquarie University. (http://www.weedfutures.net/species.php?id=1072)

Control

The control and management for gorse and brooms are similar. Management needs to address:

- Movement of seed so that new patches do not establish.
- The protection of humans and animals from damage from gorse prickles.
- The removal of sticks and stumps to allow area to be trafficable.
- Regrowth so that the plants do not re-establish.

- Seedlings so that gorse and brooms do not re-establish over time.
- Long term landuse to prevent reinfestation.

Techniques for control include fire, mechanical removal, grazing, herbicides, property hygiene and biological control. The cost of control is typically high.

New infestations should be treated prior to plants flowering. Once plants begin to seed they are much more difficult to control and spread into other areas is more likely. While isolated patches may not seem a priority for some, they are more cost effective to control than larger patches. Any infestations left uncontrolled can lead to a rapid spread and increase in the problem. Tackle small, outlying infestations first and coordinate control with neighbours. Once established, these weeds are very difficult to eradicate. Control programs need a minimum of five years commitment, including yearly inspections to check for regeneration and regrowth, and follow-up treatment.

Integrated management

Integrated management programs are essential for long-term control. This involves using a combination of control methods to get the best possible results. Repeated removal of above-ground growth, by slashing, grazing or fire, will suppress plants but will not destroy them. Treatments that shatter the roots or herbicides that move though the plant and roots are required to kill these weeds.

Fire

Adult plants are typically not killed by burning. Fire kills above ground parts of the plant but plants regrow from the root stump. Also, fire does not kill the numerous seeds buried in the soil profile. Fire stimulates seed germination. Therefore any treatment using fire should be followed up with other treatments such as herbicide for at least five years.

These shrubs, particularly gorse, produce intense heat and flames when burnt, even in winter. There are large risks associated with the use of fire, including injury to people, property, and desirable plants and fauna. Fire can only be considered if these risks have been fully managed.

Mechanical

Hand grubbing

Plants should be removed well below the soil surface. This means of control is only appropriate for small scattered plants and seedlings and only when the ground is soft.

Mechanical slashing and grubbing

The stems of these shrubs are tough. Specialist equipment is generally used to break stems, to allow further access, and to avoid puncturing tyres. Mechanical treatments that go into the ground to shatter roots are considerably more successful than top removal treatments. The extra costs to get the job done properly are worth it. Mulchers are available that break sticks to fragments and shatter roots. Since slashers and choppers do not shatter roots, plants treated by these means will almost certainly need follow-up treatment. For long-term control, mechanical clearing should be used in combination with pasture establishment to provide competition, grazing, and herbicide treatments.

Grazing

Both sheep and goats will eat gorse and broom seedlings. Sheep will generally suppress the regrowth of gorse and broom but will have little impact on adult plants. Large numbers of goats can be used to reduce the regrowth of adult gorse and brooms. Grazing is also done in combination with burning, however sheep fleece may continue to be contaminated by charcoal for years after fire.

Property hygiene

Property hygiene is important to reduce the spread of weeds. As gorse and broom seed is easily transported in mud, thoroughly check equipment, footwear, vehicles and animals for seed and wash down before leaving infested areas. Vehicles, bush walkers and horse riders should stay on tracks to reduce the amount of seed picked up on tyres, footwear and hooves.

Biological

Biological controls are best for large infestations that will not be disturbed.

Several biocontrols have been released in NSW including:

- Scotch broom gall mite (*Aceria genistae*), which is currently the best biological control agent for Scotch broom. Under favourable conditions shrubs may die due to the gall mites' impact. The effects can be limited by cooler climates.
- Twig mining moth (*Leucoptera spartifoliella*), which has minimal impact on Scotch broom, possibly due to parasitism.
- Scotch broom psyllid (*Arytainilla spartiophila*),which did not establish well and has not been seen since 2010.
- Seed beetle or bruchid beetle (*Bruchidis villosus*). Its impacts in Australia are not yet known but in New Zealand, it was destroying large numbers of seeds.

The Scotch broom gall mite is suitable for redistributing. Contact your local council weeds officer for information on using this biocontrol agent.

Herbicide

Herbicides are useful for both initial treatment and for treatment following other control methods. When using herbicides, it is important to follow the label recommendations. Herbicide control of gorse and broom frequently requires more than one treatment to be effective. The most appropriate applications are either foliar spray or cut stump methods. When applying foliar sprays ensure that the mixture is applied to the point of run-off over the whole plant, and use a penetrant or surfactant as directed on the herbicide label.

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.

Glyphosate 360 g/L (Various products)
Rate: 100–130 mL per 10 L of water
Comments: Foliar spot spray application.
Withholding period: Nil.
Herbicide group: M, Inhibitors of EPSP synthase
Resistance risk: Moderate

Picloram 100 g/L + Triclopyr 300 g/L + Aminopyralid 8 g/L (Grazon Extra®)
Rate: 250 or 350 mL in 100 L of water
Comments: Lower rate when actively growing mid-summer to pod formation. Higher rate for autumn-winter treatment.
Withholding period: Where product is used to control woody weeds in pastures there is a restriction of 12 weeks for use of treated pastures for making hay and silage; using hay or other plant material for compost, mulch or mushroom substrate; or using animal waste from animals grazing on treated pastures for compost, mulching, or spreading on pasture/crops.
Herbicide group: I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: Moderate

Picloram 44.7 g/L + Aminopyralid 4.47 g/L (Vigilant II ®)
Rate: Undiluted
Comments: Cut stump/stem injection application. Apply a 3–5 mm layer of gel for stems less than 20 mm. Apply 5 mm layer on stems above 20 mm .
Withholding period: Nil.
Herbicide group: I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: Moderate

Triclopyr 300 g/L + Picloram 100 g/L (Various products)
Rate: 250 or 350 mL per 100 L of water
Comments: Lower rate when actively growing mid-summer to pod formation. Higher rate for autumn-winter treatment.
Withholding period: Nil.
Herbicide group: I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: Moderate

Triclopyr 600 g/L (Garlon® 600)
Rate: 170 mL per 100 L of water
Comments: Late spring to early autumn. Actively growing bushes.
Withholding period: Nil.
Herbicide group: I, Disruptors of plant cell growth (synthetic auxins)
Resistance risk: Moderate

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	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Central Tablelands	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.* **Protect conservation and natural environments that are free of Scotch broom**
Greater Sydney	**Regional Recommended Measure** *Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce the impact on priority assets.*
Hunter Exclusion zone: whole region except for the core infestation area of the Upper Hunter (Barrington Tops)	**Regional Recommended Measure** *Whole region: The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers to reduce impacts from the plant on priority assets.*
Murray Snowy Valleys Council	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Murray Whole region excluding Snowy Valleys Council.	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
North Coast	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant.*

Area	Duty
North West An exclusion zone is established for all lands in the region, except the core infestation area comprising all Local Government Areas east of the Newell Highway	**Regional Recommended Measure** *Whole of region: The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone: Land managers should mitigate the risk of new weeds being introduced to their land; land managers should mitigate spread from their land; the plant should be eradicated from the land and the land kept free of the plant. Core infestation: Land managers reduce impacts from the plant on priority assets*
Northern Tablelands	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Riverina Snowy Valleys Council.	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land.*
Riverina Whole region excluding Snowy Valleys Council	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment.*
South East Core infestation area: whole region except exclusion zone of : Bega council	**Regional Recommended Measure** *Whole region: Land managers should mitigate the risk of new weeds being introduced to their land. Plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Core area: Land managers reduce impacts from the plant on priority assets.*

Scotch broom infestation. (Photo: Paul Sullivan.)

Flowering Scotch broom infestation

Left to right: Scotch broom, cape broom, gorse. (Photo: Jonah Gouldthorpe NSW DPI)

The ripe pods are brown to black. (Photo: Matthew Baker_NSW_DPI)

Dense flowering on a Scotch broom plant. (Photo: John Hosking NSW DPI)

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