

Caltrop (**Tribulus terrestris*)

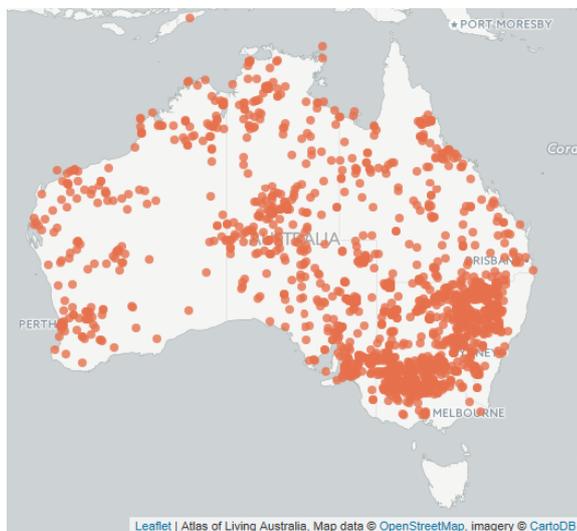
Habit & Impacts

T. terrestris is a **declared category 2 weed** under the *Natural Resource Management Act* (2004), **requiring control on private and public property**. A prostrate, annual herb, *T. terrestris* has a deep tap root and negative allelopathic properties, so can survive very dry conditions, while inhibiting germination and growth of other plant species. It is **more active and prevalent in open, degraded sites** as it doesn't compete well with established or emergent vegetation.



Caltrop copes poorly with frost so is warm-weather active only, but being a very efficient user of water also means it can survive and reproduce better than many other plants around it in drought conditions. **Flowering can start within 3 weeks of germination and seed can be produced in as little as 10 days after flowering.** The species is thought to be a native of the Mediterranean.

Individual plants can grow up to 3 metres across and are easily identifiable by **silvery fern-like leaves, hairy, reddish stems**, multiple small (5-15 mm), **five-petaled, yellow flowers** and **large spiky burrs**. A prolific producer over several months, it can produce as many as 20,000 seeds per plant; seeds which have a dormancy period of up to 7 years, but more generally 4 or 5 years. **These seeds can germinate after each significant**



Australian distribution of *T. terrestris*

rainfall event during warmer months (**October to April** approximately) and this process can repeat as long as seed is viable in the soil – seed germination is staggered so not all seedlings emerge after the first rainfall event. Seed distribution is limited where 'traffic' is not present, but it is a known inhabitant of high-traffic areas (paths, trails, roads, driveways, etc.). **Distribution has high correlation with human activity.**

T. terrestris is known to have **toxic properties for livestock**, and possibly native animals (unconfirmed), and can cause problems for feet/paws/hooves due to the nature of the thorn; this sharp thorn can also cause problems for the digestional tract if seed pods (burrs) are ingested.

Control Methods

Biological control

Due to the high number of endemic *Tribulus* species in Australia, biological control agents used successfully overseas are not so easily used here, where off-target effects could negatively affect native species. As such there is still **no effective biological control** species available for use in Australia.

Chemical control

Caltrop is controlled to varying degrees by multiple chemical combinations (glyphosate, spray.seed, Paraquat, etc.) but unless the plant is killed immediately seed can continue to mature, which limits the control and eradication effectiveness of some chemicals. Evidence suggests that **non-targeted spraying only promotes the dominance of *T. terrestris*** locally as competition is reduced and conditions improved for the target weed.

Glyphosate is clearly not an effective chemical control on its own when used on semi-mature or mature plants; bipyrindyl herbicides are a strong, more-effective alternative (if caution-dependent).

Competition

Caltrop **competes poorly with other vegetation** – likely due to competition for light resources – and so opportunities exist to ‘crowd out’ this weed through **vegetation management and/ or biodiversity improvement programmes**. Similarly, **limiting site disturbance** (soil disturbance, generalized spraying, etc.) and **effectively managing localised infestation sites** will benefit any control objectives, as would revegetation works, etc.

Alternative controls

“Grubbing” or hand removal is effective, albeit labour-intensive, **as long as there is long-term management at these sites** to remove the seed bank locally. While fallowing might seem just as useful, too much soil disturbance can actually bury the seed which makes long-term control more difficult. **Covering affected areas with 70-100 mm of mulch can be an effective tool** in preventing germination, but this has the drawback of preventing native recruitment in the same area for the benefits of competition (or biodiversity improvement) and **it likely won’t inhibit germination completely**.

Tips for hand removal

- **Find the tap root and cut off below stems (at ground level or below)**
- **Carefully place plants in disposal container as to minimise dropped thorns**
- **Try to pick up any thorns left on the ground and put in disposal container with plant material**
- **Don’t dispose of plant material in green waste bins, but burn (if possible) when time & location appropriate, or place in secure compost bays for an extended period**
- **Check shoes/ tyres for thorns when moving from one area to another and dispose of thorns carefully**



For further information please contact the Coordinator Horticulture & Biodiversity
on 8525 3200 or light@light.sa.gov.au