

Rubber vine *Cryptostegia grandiflora*

DECLARED



Description

Rubber vine is a vigorous climber with twining, whip-like shoots which can grow unsupported as an untidy, many stemmed shrub 1-2 m high, or it can scramble up to 30 m high in trees. The stems, leaves and unripe pods exude a white, milky sap when broken or cut.

Leaves are dark green and somewhat glossy, 6-10 cm long, 3-5 cm wide, and in opposite pairs.

Flowers are large and showy, with five white to light purple petals arranged in a funnel shape.

The seed pods are rigid and grow in pairs at the end of a short stalk. The pods are 10-12 cm long, 3-4 cm wide and each can contain up to 450 brown seeds. Each seed has a tuft of long white silky hairs which enable easy dispersal by wind and water.

The problem

Rubber vine generally invades waterways first, where the seeds germinate in moist silt layers after rain. The plant smothers riparian vegetation and forms dense, sometimes impenetrable thickets. This decreases biodiversity and prevents access to both stock and native animals, whilst harbouring feral animals. Infestations expand outward from waterways, colonising river falls, hillsides and pastures, resulting in loss of grazing land and increased difficulty in mustering stock.

The plant is poisonous to stock, though seldom eaten. Most deaths due to rubber vine occur after stock have been stressed, or when other feed is scarce.

Rubber vines ability to spread and colonise areas quickly has lead to it becoming a threat to many other areas of northern Australia. Due to this ability rubber vine was nominated as a Weed of National Significance.

Life cycle

Rubber vine flowers at any time of year if sufficient moisture is available. Usually, June and July are the only non-flowering months. Plant stem diameter must be approximately 20 mm before flowering can occur.

Seed pod formation occurs from spring to late autumn, with peak seed production corresponding to maximum flowering. Eventually, pods dry out and split open, with pod splitting occurring approximately 200 days after formation.

Seeds are scattered by wind, but also carried downstream by water. Approximately 95% of seed is viable, although germination requires favourable temperature and soil moisture conditions.

Habitat and distribution

Rubber vine is native to Madagascar, but is now widely distributed throughout tropical and sub-tropical regions of the world.

The plant was introduced to Australia as an ornamental shrub in 1875 or earlier, and was popular in north Queensland mining settlements due to its luxuriant growth even under harsh conditions. Weedy infestations were recorded around Charters Towers early this century.

Rubber vine prefers areas where annual rainfall between 400 and 1400 mm, and is well adapted to a monsoonal climate.

Infestations of rubber vine are now found throughout river systems of southern Cape York and the Gulf of Carpentaria, south along the coast to the Burnett River, and isolated infestations occur as far south as Gatton and as far west as the Northern Territory border.

Infestations are common throughout central Queensland, while in western Queensland there are infestations in the Mt Isa, Longreach, Aramac, Blackall, Quilpie and Charleville areas. Isolated

infestations have been reported in Western Australia.

Declaration details

Rubber vine is a declared plant under Queensland legislation. 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

Rubber vine seed is most commonly spread by wind and running water.

It is thus difficult to prevent seed coming onto uninfested land if there is rubber vine anywhere in the area. The goal should then be to prevent rubber vine from establishing and forming dense infestations. It is essential to regularly inspect all areas of your property, paying particular attention to creeks and gullies.

This is most important where prevailing winds are known to blow from infested areas; or where infestations occur upstream.

Any isolated plants located should be treated promptly.

Control

Effective control of rubber vine can be achieved by a number of methods, alone or in combination depending on the situation and the severity of infestation. All areas treated **must be periodically checked** and **any regrowth treated** or the initial treatment efforts will be wasted. Following are various methods of rubber vine control.

Biological control

Two agents are successfully established, and their impact depends on abundance. Both agents cause abnormal defoliation, creating an 'energy sink', which appears to reduce seed production. These agents do not kill established rubber vine plants.

Diseases

- Rubber vine rust *Maravalia cryptostegiae* is established over a wide area. Yellow spores are formed under the leaves and are spread mainly by the wind. It is most active over summer, abundance being directly related to leaf wetness which is dependant on rainfall and dew. Over summer a generation is completed every seven days. Rust activity is reduced over the dry season. Continued heavy infection causes defoliation, appears to reduce seed production, can kill small seedlings and causes dieback of the whip-like stems. Established plants are not killed.

Insects

- Also established is the moth *Euclasta whalleyi*, whose larvae are leaf feeders. Observation indicates the moth prefers stressed plants, either from limited soil moisture or high levels of rust infection.
- The moth's period of activity is the dry season. A native fly parasite and a disease can reduce the localised abundance of the *Euclasta* larvae.
- The larvae are tapered at both ends, grow up to 30 mm long, and are grey-brown in colour with orange dots along their sides. Fine silken threads and black bead-like droppings are often found near the larval feeding damage.
- The creamy brown moths are active at night and rest at a 45° angle from a surface, with their wings folded. The life cycle from egg to adult takes 21 to 28 days.

Defoliation reduces the smothering effect on other vegetation and causes an increase in leaf litter and promotes increased grass growth amongst rubber vine, increasing fuel loads required for fire management. Decreased flower and pod production should reduce the ability of rubber vine to spread.

Biological control is also important because it impacts on other control methods.

Chemical control

Herbicides recommended for use on rubber vine are listed in Table 2. Approximate costs and preference ratings (taking account of effectiveness and cost) are shown.

The following are details of methods of chemical control.

Foliar spraying with ground equipment

The following points should be carefully followed:

- Degree of rust infection can severely limit effectiveness of this treatment.
- It is critical that plants be actively growing and NOT water-stressed, yellowing or bearing pods.
- Only healthy plants or those with a light rust infection should be foliar sprayed.
- Wetting agent (eg. Uptake) must be used with all herbicides for foliar spraying (rate of 2-5 ml/L of spray solution).
- Thoroughly spray bushes to the point of runoff, wetting every leaf.
- Avoid spraying when hot and dry (eg. over 35°C), or when windy- especially with AF Rubber Vine spray.
- Foliar spraying is most effective on plants less than 2 m high; large plants with a stem diameter greater than 8 cm may not be killed.

Basal bark spraying

This method gives a high level of control although it is not as effective on multi-stemmed plants as it is difficult to spray each stem completely around the base. For basal bark spraying:

- thoroughly spray around the base of the plant to a height of 20-100 cm above ground level, spraying higher on larger plants.

- optimum results are attained when the plant is actively growing.

Cut stump method

This is the most successful method of chemical control, but also the most labour intensive. The following points should be carefully followed:

- cut the stem off as close to the ground (within 15 cm) as possible; for smaller plants use a machete or similar; larger plants may require a chainsaw.
- make sure the cut is horizontal.
- immediately spray or swab the cut surface.
- a cost effective method for scattered to medium density infestations is the use of a brushcutter.

Root application

Residual chemicals are not specific and non target damage is often associated with the use of root applied chemicals. Soil type will influence the activity of the herbicides, for instance, poor control may occur in heavy clay soils.

The following points should be carefully followed:

- place the residual chemical at regular intervals around the plant.
- do not use residual herbicides within a distance of two or three times the height of desirable trees.
- do not use Graslan along waterways or land with greater than a 20° slope.
- a minimum of 50-80 mm of rainfall is required before residual herbicides are taken up by the plant.

Aerial application

- Degree of rust infection can severely limit this treatment.
- People considering aerial application are advised to contact the Tropical Weeds Research Centre for current advice on use of this technique.

Fire

Rubber vine infestations can be controlled by burning. To use fire successfully a sufficient fuel load is required to carry a fire through the infestation. This may involve managing your pastures to allow grass yield to reach greater than 1500kg/ha which is considered a sufficient fuel load. Such fires reduce the bulk of rubber vine present and help prevent establishment of new plants. Herbicides should be used on any surviving rubber vine.

- It is recommended that two successive annual burns be employed. The first fire to open up the infestation to increase grass growth (fuel load) whilst killing some rubber vine plants. The second fire will cleanup the plants not killed in the first fire.
- An appropriate fire regime is an effective tool for managing rubber vine over the long term, as well as being an effective follow-up to other control methods.
- For further information contact the Tropical Weeds Research Centre.

Mechanical

Several mechanical techniques are effective in controlling rubber vine. The type of infestation will determine the technique required.

- Scattered - Medium density infestations: Where possible, repeated slashing close to ground level is recommended.
- Dense infestations: During winter, stickraking or bladeploughing reduces the bulk of the infestation. Pasture should be sown and windrows burnt to kill residual seed. Follow-up treatment is essential. Tree clearing guidelines must be followed.

Control strategies

All control of rubber vine will require follow-up treatments to keep the property clean. As rubber vine spreads quickly, small infestations should be controlled first to prevent them from becoming major problem areas. Dense infestations are difficult and costly to treat.

Follow-up treatment must be budgeted for within the overall control program. Techniques need to be integrated for successful rubber vine management. Consideration should be given to coordinating control over a catchment area.

Five suggested strategies for controlling rubber vine in scattered, medium, and dense infestations are shown in Table 1.

Further information

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

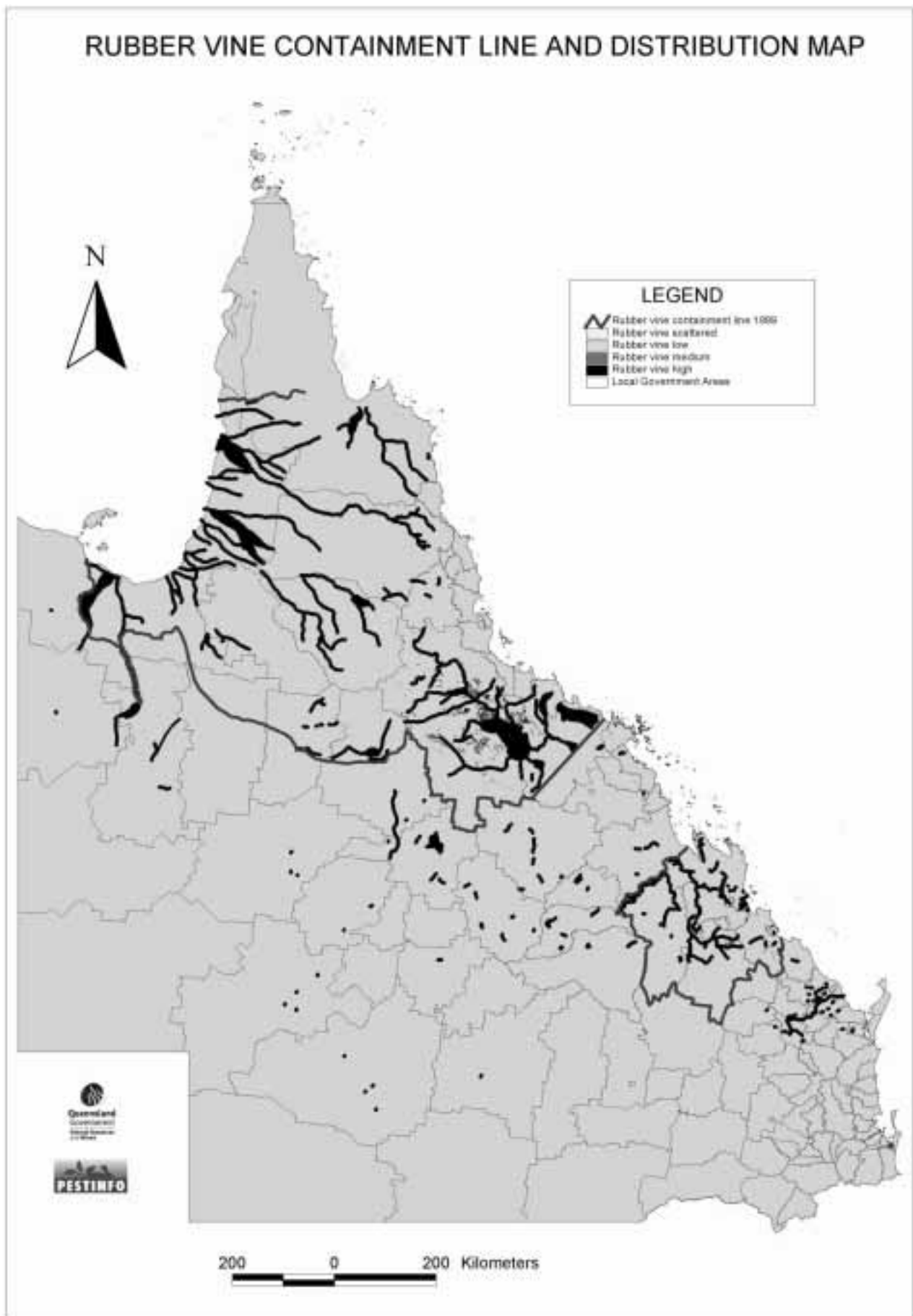


TABLE 1 - SUGGESTED STRATEGIES FOR THE CONTROL OF RUBBER VINE

	Initial Treatment	Follow-up	Remarks
SCATTERED INFESTATIONS	Basal bark/cut stump	Follow-up with basal bark/cut stump as necessary	Cut stump method preferred where possible.
	Foliar spray	Follow-up basal bark/cut stump/foliar spray as necessary	Only foliar spray when there is nil to little rust on the leaves of the plants.
	Fire	Follow-up basal bark/cut stump/foliar spray as necessary	For scattered infestations usually recommended only if herbicides not desired, or if have other weeds can be controlled by fire or if fire is utilised to improve pastures.
	Repeated slashing	As above	
MEDIUM INFESTATIONS	Foliar spray	Treat regrowth, seedlings with basal bark/cut stump/foliar spray	Fire and follow-up with basal bark/cut stump/foliar spray as necessary.
	Fire	Fire 1 year later and follow-up basal bark/cut stump/foliar spray as necessary	If fuel load is sufficient. CAUTION: There are some native tree species which are susceptible to fire. Check before burning.
	Repeated slashing	As above	
DENSE INFESTATIONS Previously cleared areas	Stick rake or blade plough	Sow pasture ⇒ Basal bark/foliar spray ⇒ Fire and basal bark/cut stump/foliar spray as necessary	First treatment clears bulk of rubber vine and kills roots; any regrowth or seedlings can then be treated; when grass growth allows fuel build up, fire used as control and individual plants later treated.
	Fire	Fire 1 year later and follow-up basal bark/cut stump/foliar spray as necessary	If fuel load is sufficient. CAUTION: There are some native tree species which are susceptible to fire. Check before burning.
	Aerial spray	Fire 1-2 years later OR Follow-up with basal bark spray	Bulk of rubber vine killed with aerial spray; allow build up of fuel for fire or treat remaining plants with basal bark spray. Contact Tropical Weeds Research Centre before use of method.
	Graslan		Where situation and soil type are suitable.
DENSE INFESTATIONS along creeks and rivers	Aerial spray	Fire OR basal bark/cut stump/foliar spray ⇒ Follow-up with basal bark/cut stump/foliar spray as necessary	As above
	Basal bark/cut stump	Fire OR basal bark/cut stump/foliar spray	When bulk of rubber vine killed, allow fuel build up for fire or treat remaining plants individually.
	Fire and sow pasture	Fire 1 year later and follow-up basal bark/cut stump/foliar spray as necessary	If there is a sufficient fuel load to carry a fire, it can open up dense infestations. CAUTION: There are some native tree species which are susceptible to fire. Check before burning.

TABLE 2 - HERBICIDES REGISTERED FOR THE CONTROL OF RUBBER VINE

	Tradename/ Chemical	Pref. *	Rate	Optimum Stage and Time	Remarks
1. Foliar (overall) spray (ground)	Grazon DS	1	0.35 L/ 100 L Water	During active growth	May damage pasture legumes.
	Banvel 200	1	1 L/100 L Water	As above	As above.
	Brushhoff	1	15 g/100 L Water	As above	As above; wetting agent is critical. Complete coverage is essential
	Tordon 75-D	2	1 L/150 L Water	As above	As above.
	AF Rubber Vine Spray (2,4-D Ester)	3	0.5 L/100 L Water	As above	May damage pasture legumes; less effective than other treatments, but also much cheaper.
2. Basal bark	AF Rubber Vine Spray (2,4-D Ester)	1	2.5 L/100 L Diesel	Plants actively growing	Thoroughly spray around base of plant.
	Access	1	1 L/60 L Diesel	Anytime	Registered for use 1995.
3. Cut stump	AF Rubber Vine Spray (2,4-D Ester)	1	2.5 L/100 L Diesel	Anytime	Immediately swab/spray cut surface and base of stem.
	Access	1	1 L/60 L Diesel	As above	As above.
	Brushhoff	1	1 g/1L Water	As above	As above; wetting agent is critical.
	Amicide 500 (2,4-D Amine)	2	2 L/1 00 L Water	As above	As above; less effective than other treatments. Repeat applications may be required.
4. Soil application (see # below)	Velpar L #	1	1 - 4 ml/spot	Prior to rain	See warning below. Must place spots around bush. Less effective on sandy soils.
	Graslan #	1	1.5 g/m2	As above	As above; application by hand or backpack spreader
5. Aerial application	Grazon DS	1	3 - 5 L/ha	Plants actively growing	Before aerial application contact Tropical Weeds Research Centre.
	Graslan #	1	7.5 - 15 kg/ha	Prior to rain	As above.
	AF Rubber Vine Spray (2,4-D Ester)	3	5 - 7 L/ha	Plants actively growing	As above.

* Preference Rating - takes account of effectiveness and cost

WARNING:

Soil testing is highly recommended prior to application of these herbicides, as rate and efficacy are dependant on soil type. DO NOT USE SOIL APPLIED HERBICIDES (VELPAR AND GRASLAN) WITHIN A DISTANCE OF TWO TO THREE TIMES THE HEIGHT OF DESIRABLE TREES. DO NOT USE GRASLAN NEAR WATERWAYS OR LAND WITH GREATER THAN A 20° SLOPE.

<p>Find more <i>NRM Facts</i> at <www.nrm.qld.gov.au>; on the NR&M Free Faxback Line, phone 1800 240 691 and PrimeNotes CD-ROM, phone 1800 816 541.</p>	<p>The control methods suggested above should be used in accordance with restrictions (for example, federal and state legislation, local government laws, product manufacturer's guidelines) directly or indirectly relating 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 the information in this fact sheet, the Department of Natural Resources and Mines does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.</p>
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