Fact sheet

DECLARED CLASS 2 PEST PLANT

Chinee apple

Indian jujube

Ziziphus mauritiana

Dense infestations of chinee apple (or Indian jujube) create impenetrable thickets that seriously hamper stock management and reduce pasture production and accessibility. Mature trees produce large quantities of fruit that are readily eaten by stock, feral pigs, wallabies and birds, which assists the spread of the seed. Damage to top parts of the plant usually ensures regrowth from lignotubers or cut roots.

Declaration details

Chinee apple 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.

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Queensland Government

Description and general information

Chinee apple is a large shrub or small spreading tree up to 8 m high and 10 m in canopy diameter. The plants are densely branched, from ground level in some cases. Stands of chinee apple grow as open forests or form thorny thickets along waterways. Branches are zig-zag in shape and have a leaf and a thorn at each angle.

Leaves are rounded, glossy green on top and almost white underneath, and grow on alternate sides of the branches. Flowers are small and inconspicuous, greenish-white and emit an unpleasant smell. The edible fruits are similar in size and structure to a cherry, but pale yellow or orange when ripe.

Habitat and distribution

Chinee apple is native to southern Asia and eastern Africa. It was first recorded in the Torres Straits in 1863 and in Townsville in 1916.

The species is widespread in north Queensland, mainly in the areas surrounding towns associated with mining early this century. The largest areas of dense chinee apple are around Charters Towers, Mingela, Ravenswood and Hughenden, but the plant also occurs around many other towns in the drier parts of north and central Queensland.

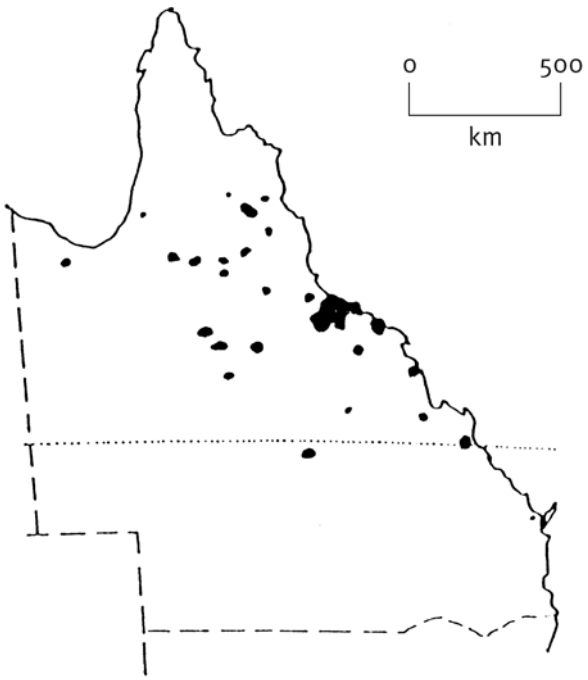
Chinee apple is restricted to the drier tropics with an annual rainfall of less than 1–200 mm. It also grows in areas with an annual rainfall as high as 470 mm. During the dry season, the plant drops most of its leaves in response to water stress but rapidly produces new leaves with the opening rains of the wet season. Although the species does have a tendency to spread along watercourses in the drier regions, it is also capable of growing into dense stands on dry, exposed hillsides.

Chinee apple occurs in a wide range of soil types in association with different vegetation groups. It has successfully established on coarse-textured, gravelly mullock heaps; deep coarse-textured sands; deep alluvial soils; shallow-surfaced solodic soils; and cracking clay soils. The pattern of spread away from the towns has shown no marked preference for any soil type or vegetation association.

The major factor that appears to affect the growth of chinee apple is the density of the associated vegetation. Chinee apple does not establish successfully under the canopy of other trees and the species is normally restricted to areas that have sparse tree cover or where the other tree vegetation has been removed.

The old mining centres provided ideal conditions for establishment of chinee apple with the complete removal of all trees for pit timber and fuel. Chinee apple is now virtually the only tree species growing for several kilometres around these centres.

Figure 1 Distribution of chinee apple



Control

Effective control of chinee apple can be achieved through a combination of mechanical and herbicide treatments, or by herbicide treatment alone. All areas treated must be periodically checked and any regrowth treated or the initial treatment efforts will be wasted. Follow-up is esential to ensure a successful control program.

Mechanical control

Dense infestations can be initially cleared by stick raking, ripping or using a cutter bar (if the terrain and soil type permit). Remaining broken and exposed stems should be treated by basal bark spraying as soon as possible following clearing.

In order to ensure a successful control program, regrowth must be sprayed.

Cultivation and planting crops or improved pasture will assist in the prevention of re-infestation. Herbicide treatment of regrowth should still be carried out and maintained so the initial program is not wasted.

Fire will cause some damage to the plant but regrowth is normally rapid and few plants are killed. Seedlings may be more susceptible to fire but the survival of mature plants will maintain the existing problem.

Herbicide control

The methods of chemically treating chinee apple are described below. The herbicides registered for these methods are listed in Table 1.

Basal bark spray

For stems up to 15 cm in diameter, carefully spray completely around the base of the plant to a height of 40 cm above ground level. It is important to thoroughly spray into the crevices of multi-stemmed plants. Larger trees may be controlled by spraying to a greater height, up to 100 cm above ground level. The best time for treatment is during autumn when plants are actively growing and soil moisture is good.

Cut stump treatment

At any time of year, cut the stems off horizontally as close to the ground as possible and immediately (within 15 seconds) swab or spray the cut surfaces and associated stem with the herbicide mixture.

Soil application

Apply granules over an area extending from the main stem to 30 cm outside the canopy drip line to cover the main part of the root system. Treated plants will not be affected until sufficient rainfall moves the herbicide into the root zone. Do not use residual herbicides within a distance of twice the height of desirable trees.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).

Table 1 Herbicides registered for the control of chinee apple

Situation	Herbicide	Rate	Optimum stage and time	Comments
Basal bark/ cut stump	Triclopyr and picloram e.g. Access®	1 L/60 L diesel	Basal bark spray when actively growing Cut stump any time of year	Thoroughly spray all crevices. Basal bark spray plants with up to 15 cm basal diameter. Cut stump plants with greater than 15 cm basal diameter. For cut stump, spray immediately after cutting.
	Fluroxypyr e.g. Starane 200®	3 L/100 L diesel		Spray plants with up to 15 cm basal diameter. For cut stump, spray immediately after cutting.
	Fluroxypyr e.g. Tomigan 200EC®	3 L/100 L diesel		
	Triclopyr e.g. Garlon 600®	1 L/60 L diesel	Basal bark spray when actively growing Cut stump any time of year	Thoroughly spray all crevices. For cut stump, spray immediately after cutting.
	Triclopyr e.g. Invader 600®	1 L/60 L diesel		Basal bark spray suckers and seedlings with up to 5 cm basal diameter. Cut stump suckers or seedlings with greater than 5 cm basal diameter. Spray immediately after cutting.
	Triclopyr e.g. Hurricane 600®	1 L/60 L diesel		
	Triclopyr e.g. Redeem 600®	1 L/60 L diesel		Basal bark spray plants with up to 5 cm basal diameter.
	Triclopyr e.g. Triclon®	1 L/60 L diesel		Basal bark spray plants with up to 5 cm basal diameter. Cut stump plants with greater than 5 cm basal diameter. Spray immediately after cutting.
	Triclopyr e.g. Tryclops®	1 L/60 L diesel		
	Triclopyr e.g. Safari 600EC®	1 L/60 L diesel		
Basal bark spray only	2,4-D e.g. AF Rubber Vine Spray®	1 L/10 L diesel	When actively growing	Basal bark spray plants with up to 5 cm basal diameter.
High volume spray	Triclopyr and picloram e.g. Grazon DS®	0.35 L/100 L water	Seedling regrowth to 2 m Spray when plants are actively growing	A wetting agent is recommended to increase effectiveness.
Soil application	Picloram-triethanolamine e.g. Tordon® granules	35–45 g/m^2	Apply prior to expected rain	Refer to label for critical comments.

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