

Declared Plant Policy
under the Natural Resources Management Act 2004

azarola (Crataegus sinaica)



**Government
of South Australia**

Azarola is a species of hawthorn that occurs in isolated infestations at present and has not reached its ecological limits in the State. Where infestations are not managed, they have the potential to invade bush in the Adelaide Hills and similar high rainfall areas, reducing the amenity and conservation values of these sites.

Management Plan for Azarola

Outcomes

- Maintain the integrity of native vegetation in high rainfall regions.
- Maintain the amenity of recreation areas susceptible to invasion by azarola

Objectives

- Prevent any further naturalisation of azarola.
- Remove high priority infestations of azarola in the control areas.
- Contain any intractable infestations in these areas.
- Prevent the further spread of azarola.

Implementation

- NRM authorities in the active control areas to ensure all high priority infestations, as determined by the authority, on private or public land are controlled.
- NRM authorities to control infestations on road reserves subject to regional priorities.
- Any infestations too large for immediate destruction in these areas to be the subject of plans for containment and progressive reduction.
- NRM authorities and the Chief Officer to enforce the prohibition on sale of plants of azarola.

Regional Implementation

Refer to regional management plans for further details.

azarola policy

NRM Region	Actions
Adelaide and Mount Lofty Ranges	monitor
Alinytjara Wilurara	limited action
Eyre Peninsula	destroy infestations regional alert
Kangaroo Island	monitor – not present regional alert
Northern and Yorke	protect sites
South Australian Arid Lands	limited action
South Australian Murray Darling Basin	limited action
South East	destroy infestations regional alert

Declaration

To implement this policy, azarola is declared under the *Natural Resources Management Act, 2004* throughout the whole of the State of South Australia. The movement or transport of the plant on a public road, by itself or as a contaminant, or the sale by itself or as a contaminant is prohibited. NRM authorities in the Adelaide and Mount Lofty Ranges and South East NRM regions may require land owners to control azarola plants growing on their land; in these regions, NRM authorities are required to control plants on road reserves and may recover costs from the adjoining land owners.

Azarola is declared in category 3 under the Act, for the purpose of setting maximum penalties and for other purposes. Any permit to allow its movement or sale can only be issued by the regional NRM Board pursuant to section 188.

The following sections of the Act apply to azarola throughout each of the NRM regions noted below:

Sections of Act	Region							
	AMLR	AW	EP	KI	NY	SAAL	SAMDB	SE
175(1) Prohibiting entry to area								
175(2) Prohibiting movement on public roads	X	X	X	X	X	X	X	X
177(1) Prohibiting sale of the plant	X	X	X	X	X	X	X	X
177(2) Prohibiting sale of contaminated goods	X	X	X	X	X	X	X	X
180 Requiring notification of infestations								
182(1) Landowners to destroy the plant on their properties								
182(2) Landowners to control the plant on their properties	X							X
185 Recovery of control costs on adjoining road reserves	X							X

Review

This policy is to be reviewed by 2020 or in the event of a change in one or more regional management plans for azarola.

Weed Risk

Invasiveness

Azarola invades a broad range of vegetation communities including riparian and coastal areas. It has slow early growth with its competitive ability low at the seedling stage but high once the bushes are established.

Azarola reproduces by seed and suckers. They produce large amounts of seed in the edible fruit (haws), which can be spread long distances when consumed by birds and mammals. Over 2,000 fruits with 2-3 seeds each would be produced on a mature tree. Seed is dispersed effectively by birds and mammals, and takes 2 or more years to germinate as it is enclosed in a hard pit. Spread can occur to a lesser extent via mud and fruit adhering to machinery, vehicles and animals. Much of the spread in the past was by deliberate plantings, but this has ceased.

Impacts

Azarola is a deciduous, dense shrub or small tree which can grow to 7 metres high and wide. It forms dense thickets that seriously impede movement of stock and humans.

Azarola can have a major impact on bushland habitats, shading out ground-flora and affecting the growth and regeneration of overstorey plants. It is likely that the leaves dropped each autumn impact on biodiversity by increasing nutrients levels in surface soil.

Dense patches of hawthorns compete with native regrowth and form spiny thickets that provide good cover for rabbits and other pests. In the British Isles, hawthorn species are an important reservoir of the fire blight bacterium which affects pears and apples. Azarola also is known to host Mediterranean fruit fly and light brown apple moth.

Potential distribution

Azarola infestations are restricted to areas within the 600 mm annual isohyet, but could also develop along streams near former plantings in drier areas. Potential habitats occur in parts of the Adelaide and Mount Lofty Ranges, Eyre Peninsula, Kangaroo Island, Northern and Yorke and South East regions.

Feasibility of Containment

Control costs

There are a variety of control methods for azarola. Mature stands can be controlled using cut and paint or stem injection. Small plants are susceptible to spot spraying. Seedlings can be hand-pulled.

Persistence

Azarola plants are slow-growing but long lived, possibly living for centuries. Like other hawthorns, they are tolerant to the levels of frost encountered in SA, and to moderate levels of drought and salinity.

Current distribution

There are infestations of azarola on the western slopes of the Mount Lofty Ranges from Paracombe to Balhannah. There is also one infestation recorded at Clare in the Mid North.

State Level Risk Assessment

Assessment using the Biosecurity SA Weed Risk Management System gave the following comparative weed risk and feasibility of containment scores by land use:

Land use	Weed Risk	Feasibility of control	Response at State Level
Native vegetation	low 25	very high 2	monitor
Urban	negligible 1	very high 1	monitor

Considerations

Azarola was proclaimed for a small number of local government areas in the Adelaide Hills in 1980 as a "community pest plant". Because hawthorns are slow-growing shrubs, they were not been given a high priority by boards and there has been no significant change in their abundance since 1990. Risk assessment at the State level implies monitoring infestations; azarola scores low on weed risk and very high on feasibility of control, due to its limited potential range. There is an option to destroy incursions as necessary in two of the NRM regions where it is currently absent but has potential to infest (Eyre Peninsula and the South East).

Azarola is a larger hawthorn than *Crataegus monogyna*, developing into a small tree. It occurs in the central and eastern parts of the Mediterranean region, and was introduced by the Adelaide Botanic Gardens in the 1850s as a hedge and crop plant.

Some *Crataegus* plants in the Adelaide Hills have characters intermediate between azarola and may, and are believed to be F₁ hybrids of these two hawthorns. Hybridisation among *Crataegus* species, especially involving *C. monogyna*, is very frequent overseas. Azarola is an ancient cultivated fruit that probably originated as a hybrid of *Crataegus azarolus* with *C. monogyna*, which may explain its frequent backcrossing to *C. monogyna* in the Adelaide Hills.

Azarola is occasionally used as an ornamental and as a source of fruit for jam. It is a long-lived but slow-growing tree.

Synonymy

Crataegus sinaica Boiss., Diagn. Pl. Orient. ser. 2, 2: 48 (1856)

Nomenclatural synonym:

Crataegus azarolus L. var. *sinaica* (Boiss.)Lange, Revisio Specierum Generis Crataegi (1897)

Other common names include za'rur. The common name azarola is also applied to *Crataegus azarolus*, which is naturalised in SA.

References

Albarouki, E. & Peterson, A. (2007) Molecular and morphological characterisation of *Crataegus* L. species (Rosaceae) in southern Syria. *Bot. J. Linnean Soc.* 153: 255-263.

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