



Government
of South Australia

Declared Plant Policy

This policy relates to natural resources management under section 9(1)(d) of the Landscape South Australia Act 2019 (the Act), enabling co-ordinated implementation and promotion of sound management programs and practices for the use, development or protection of natural resources of the State. Specifically, this policy provides guidance on the use and management of natural resources relating to the prevention or control of impacts caused by pest species of plants that may have an adverse effect on the environment, primary production or the community, as per object s7(1)(f) of the Act.

silverleaf nightshade (*Solanum elaeagnifolium*)

Silverleaf nightshade is a deep rooted perennial plant that is drought tolerant. Silverleaf nightshade does not spread as rapidly as some weeds but once established it is very difficult to control. It occurs in all regions of the State, with the largest infestations in the Mid North and Eyre Peninsula.

Management Plan for Silverleaf Nightshade

Outcomes

- Pasture and crop production maintained in areas susceptible to invasion by silverleaf nightshade.

Objectives

- Existing infestations of silverleaf nightshade contained to their present size and progressively reduced.
- Spread of silverleaf nightshade to uninfested properties prevented.

Best Practice Implementation

- Regional landscape boards and Green Adelaide to ensure high priority infestations, according to their size and strategic location, on private properties are controlled.
- Regional landscape boards and Green Adelaide to develop plans to control or contain other infestations in collaboration with landholders.
- Regional landscape boards and Green Adelaide to control priority infestations on road reserves and may recover costs from adjoining landholders.
- Regional landscape boards and Green Adelaide to promote landholder understanding of the potential of silverleaf nightshade to spread, its impacts on agricultural areas and techniques to reduce risk of spreading the weed.

Regional Implementation

Refer to regional management plans for further details.

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Region	Actions
Alinytjara Wilurara	Manage weed
Eyre Peninsula	Manage weed
Green Adelaide	Manage weed
Hills and Fleurieu	Manage weed
Kangaroo Island	Destroy infestations
Limestone Coast	Destroy infestations
Murraylands and Riverland	Protect sites
Northern and Yorke	Contain spread
South Australian Arid Lands	Monitor

Declaration

To implement this policy, silverleaf nightshade is declared under the *Landscape South Australia Act 2019* throughout the whole of the State of South Australia. Its movement or transport on a public road by itself or as a contaminant, or its sale by itself or as a contaminant are prohibited.

Regional landscape boards and Green Adelaide may require land owners to control silverleaf nightshade plants growing on their land; these authorities are required to control plants on road reserves in their regions, and may recover costs from the adjoining land owners. In the Limestone Coast region, land owners are required to notify their landscape board of silverleaf nightshade infestations on their land to ensure that these are controlled.

Silverleaf nightshade is declared in category 2 under the Act for the purpose of setting maximum penalties and for other purposes. Any permit to allow its road transport or sale can only be issued by the Chief Executive of the Department for Environment and Water or their delegate pursuant to section 197.

Under the *Landscape South Australia (General) Regulations 2020*, Regulation 27 specifies the conditions under which a person is exempt from the operation of section 186 and may transport wool, grain or other produce or goods carrying silverleaf nightshade on public roads. Regulation 28 specifies conditions under which a person is exempt from the operation of section 188(2) and may sell wool, grain or other produce or goods carrying silverleaf nightshade. Note that certain produce or goods may be excluded from these general movement and sale exemptions by Gazettal Notice of the Chief Executive, DEW.

The following sections of the Act apply to silverleaf nightshade throughout each of the regions noted below:

Sections of Act	Region								
	AW	EP	GA	HF	KI	LC	MR	NY	SAAL
186(1) Prohibiting entry to area									
186(2) Prohibiting movement on public roads	X	X	X	X	X	X	X	X	X
188(1) Prohibiting sale of the plant	X	X	X	X	X	X	X	X	X
188(2) Prohibiting sale of contaminated goods	X	X	X	X	X	X	X	X	X
190 Requiring notification of presence						X			
192(1) Land owners to destroy the plant on their properties									
192(2) Land owners to control the plant on their properties	X	X	X	X	X	X	X	X	X
194 Recovery of control costs on adjoining road reserves	X	X	X	X	X	X	X	X	X

Review

This policy is to be reviewed by 2025 or in the event of a change in one or more regional management plans for silverleaf nightshade.

Weed Risk

Invasiveness

Silverleaf nightshade will easily establish among existing plants under suitable conditions, which usually occur in years with an unusually high summer rainfall. Its initially small seedlings are vulnerable to drought until they get roots down to the subsoil.

Seed is most commonly spread by the movement of livestock but can also be dispersed by wind, water, agricultural machinery and tools, as well as in feed, some grains and vehicles. Wind can also blow mature plants with attached berries along the ground. Within a paddock, root fragments can be spread by cultivation and form new infestations.

Impacts

Silverleaf nightshade impacts significantly on cropping and pastures, by reducing yield and carrying capacity, and sometimes land values. It competes directly with summer crops and indirectly with winter crops by reducing available moisture and nutrients. Annual winter pastures are affected through delayed autumn emergence and lower productivity, resulting in reduced carrying capacity. On the Eyre Peninsula, yield losses range from 5-15% in heavy red clays to 30-50% in light sandy soils.

Silverleaf nightshade infestations do not severely affect orchards or vineyards but do compete with cover crops grown in these situations. Infestations can interrupt tillage and harvesting practices as well as blocking drains and irrigation channels. When infestations are heavy in pastures, the closed canopy cover restricts available light for other vegetation, and restricts access of stock to the feed below.

Infestations of silverleaf nightshade increase production costs through control requirements and reduce return and productivity of land.

All parts of the plant, but particularly the berries, are potentially toxic to animals but poisoning rarely if ever occurs in South Australia. The alkaloids present in the plant have been shown to exhibit allelopathic characteristics on the germination of other plants.

Silverleaf nightshade is an alternative host for phytophagous insects and plant diseases such as root rot (*Rhizoctonia solani*) and wilt (*Verticillium albo-atrum*).

Potential distribution

Silverleaf nightshade has the potential to grow across most of the cropping and grazing land uses in the State, especially those areas with a cool, wet winter and hot dry summer. It thrives on disturbed land and will inhabit warm temperate regions in areas with 250-600 mm annual rainfall.

Feasibility of Containment

Control costs

Once established, silverleaf nightshade is very difficult to eradicate, as it has a very high tolerance to standard weed management practices. Each plant has a very extensive root system that can extend to 3 m deep and 2 m horizontally. Silverleaf nightshade does not spread rapidly, however once established it is difficult and costly to remove and requires an integrated control strategy which includes herbicide application as well as introducing competitive desirable species or changing land use.

There are currently very limited effective broad acre control methods as its extensive root system allows it to survive chemical and mechanical methods. In areas where isolated infestations exist it is critical to begin control immediately to minimise the spread of this weed. Where already established, co-ordinated control efforts are required for successful ongoing management of this species to minimise yield losses and spread.

Limits on stock movement in infested areas when berries are present, and sound hygiene practices are important actions to curb the spread of this weed. Stock from infested areas that may have recently eaten berries must be quarantined for at least 14 days to allow seed to pass through the digestive tract

Silverleaf nightshade is similar in appearance to some native *Solanum* species and may go unrecognised.

Persistence

Established plants are adapted to a wide range of habitats, are highly resistant to drought and tolerant of saline conditions but are sensitive to frost and water logging. Regeneration from dormant buds on established roots is the most important method of multiplication. Root fragments can regenerate even buried up to 20 cm deep and from pieces as small as 0.5 cm long when soil moisture conditions are suitable. Removing aerial parts of the plant encourages sprouting, and seedlings as young as 10 days old can regenerate.

Seeds may last up to 10 years in the soil. High numbers of seedlings are only occasionally observed, as seeds have specific moisture and temperature requirements for germination that usually occur in late spring to early autumn. Seed germination is thought to be enhanced by passage through the gastrointestinal tract of animals. As germination is infrequent, extensive viable seed banks may quickly build up.

Current distribution

Silverleaf nightshade occurs in all regions of the State. Currently in South Australia, approximately 50,000 to 60,000 ha of land are infested with up to 40,000 ha of this in cereal growing areas. It is most widespread in the agricultural areas of the Mid North, Eastern Eyre Peninsula and Riverland areas. Localised and isolated infestations have been found in the Alinytjara Wilurara, Kangaroo Island, Limestone Coast and South Australian Arid Lands regions.

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:

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Land use	Weed Risk	Feasibility of control	Response at State Level
Irrigated pastures	high 101	medium 55	protect sites
Grazing - southern	high 118	low 81	manage weed
Crop pasture rotation	high 152	low 85	manage weed
Perennial horticulture	medium 39	medium 42	manage sites
Grazing- rangeland	negligible 8	very high 11	monitor
Forestry	negligible 6	medium 56	limited action
Irrigated vegetables	low 25	medium 48	limited action

Considerations

Silverleaf nightshade has been introduced to many temperate areas around the world, and is a weed in many of these regions as well as in parts of its native range. It has been in Australia since the early twentieth century and is now recorded in all States and Territories apart from Tasmania. The most serious infestations occur in the wheat belt areas of New South Wales, Victoria and South Australia.

Risk assessment indicates strategic management approach for each land use. Protecting sites in irrigated pastures is the highest priority action at the State level.

Management of silverleaf nightshade is necessary in permanent and rotational pastures, the land uses where it poses the greatest risk in the regions where it is established. Prevention of further spread to clean areas is critical since control of established infestations is slow and expensive.

Containment is important in the Northern and Yorke region where infestations are still localised. The Alinytjara Wilurara and Eyre Peninsula regions aim to manage the weed; Hills and Fleurieu promotes management and targeted control in priority sites. The Murraylands and Riverland region protects higher priority sites. Destruction of infestations is the aim in the Kangaroo Island and Limestone Coast regions where silverleaf nightshade is present in very low numbers. Infestations are monitored in the South Australian Arid Lands region.

Silverleaf nightshade has been recognised as a Weed of National Significance and is the subject of a national control strategy.

Synonymy

Solanum elaeagnifolium Cav., Icon. 3: 22 (1795).

Taxonomic synonyms:

Solanum dealbatum Lindl., Trans. Hort. Soc. 7: 52 (1830)

Solanum flavidum Torr., Ann. Lyceum Nat. Hist. New York 2: 227 (1828)

Solanum leprosum Ortega, Nov. Rar. Pl. Descr. Dec.9: 115 (1800)

Solanum roemerianum Scheele, Linnaea 21: 767 (1849)

Solanum texense Engelm. & Gray, Boston J. Nat. Hist. 5: 227 (1845)

Other common names include bullnettle, white horsenettle, tomato weed, bitter apple and sataansbos.

References

Heap, J. & Wu, H. (2018) *Silverleaf Nightshade: Australian best practice management manual*. Primary Industries and Regions SA & NSW Department of Primary Industries: Adelaide).

Hon David Speirs MP

Minister for Environment and Water

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