



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.

golden dodder (*Cuscuta campestris*)

Dodders are annual parasitic weeds that grow attached to a wide range of host plants. They have thread-like leafless stems that twine around the host, attaching by haustoria through which the dodder draws all its water and nutrients.

Golden dodder is established in the Riverland, with occasional incursions in other parts of South Australia.

Management Plan for Golden Dodder

Outcomes

- No golden dodder contamination of vegetable or forage seed produced in South Australia.
- No further establishment of golden dodder on uninfested lands.

Objectives

- Outbreaks of golden dodder in agricultural areas destroyed.
- No movement of golden dodder from currently infested areas to new sites.
- Golden dodder in amenity areas and accessible riverbanks in the Riverland managed to minimise seed production and infestation density.

Best Practice Implementation

- Prohibitions on sale and movement of contaminated produce enforced by regional landscape boards, Green Adelaide and the Chief Executive of the Department for Environment and Water.
- Regional landscape boards and Green Adelaide to ensure new infestations are located, notified to the Chief Executive, DEW, and destroyed in accordance with regional management plans.
- Regional landscape boards and Green Adelaide to co-ordinate regular inspection of previously infested areas with land managers.
- In areas at risk of infestation, regional landscape boards to conduct inspections of lucerne and other host crops to ensure freedom from dodder.

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- Regional landscape boards to monitor hay, machinery and seed movement from infested properties to ensure dodder does not leave area.

Region	Actions
Alinytjara Wilurara	Prevent entry; destroy if detected
Eyre Peninsula	Prevent entry; destroy if detected
Green Adelaide	Destroy infestations
Hills and Fleurieu	Destroy infestations
Kangaroo Island	Prevent entry; destroy if detected
Limestone Coast	Destroy infestations
Murraylands and Riverland	Destroy in irrigated pastures Contain spread in aquatic areas, Manage weed in native vegetation
Northern and Yorke	Prevent entry; destroy if detected
South Australian Arid Lands	Prevent entry; destroy if detected

Declaration

To implement this policy, golden dodder is declared under the *Landscape South Australia Act 2019* throughout the whole of the State of South Australia. Its entry to South Australia, movement or transport on a public road by itself or as a contaminant, or sale by itself or as a contaminant are prohibited. Notification of infestations is necessary to ensure these are destroyed. Land owners are required to destroy any golden dodder growing on their land. Landscape boards and Green Adelaide are required to destroy plants on road reserves in their regions, and may recover costs from the adjoining land owners.

Golden dodder is declared in category 1 under the Act for the purpose of setting maximum penalties and for other purposes. Any permit to allow its entry, road transport or sale can only be issued by the Chief Executive, DEW 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 golden dodder on public roads, or bring them into the State. 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 golden dodder. 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 golden dodder 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	X	X	X	X	X	X	X	X	X
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	X	X	X	X	X	X	X	X
192(1) Land owners to destroy the plant on their properties	X	X	X	X	X	X	X	X	X

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192(2) Land owners to control the plant on their properties									
194 Recovery of control costs on adjoining road reserves	X	X	X	X	X	X	X	X	X

Review

Success of the program will be measured by its effectiveness in preventing any new outbreaks of golden dodder in South Australia. This policy is to be reviewed by 2025.

Rationale

Although dodders were proclaimed a noxious weed for the whole of the State in 1919, it was not until 1931 that some collections were identified as the major weed golden dodder.

Golden dodder is a threat to production in irrigated crops and forage, and to export markets for lucerne seed and other small seeds from South Australia. It is therefore necessary to prevent further spread, reduce seed bank under old infestations and maintain the image of the south-east of South Australia as a dodder-free area.

Weed Risk

Invasiveness

Golden dodder has high seed production but the seed is not well adapted for long distance dispersal. Some can be transported by birds or by floodwaters, but the dispersal has been chiefly by human activity in transporting contaminated hay, livestock, seed for sowing and vehicles.

As dodder depends on the habitat provided by host plants, it has a high ability to establish within this specialised habitat. The host range of golden dodder is wide, including many dicot crops and herbaceous weeds, especially legumes and Asteraceae. Grasses and woody plants are not potential hosts.

Impacts

Dodder poses a threat to some vegetable crops such as onions and tomatoes, lucerne grown for hay or seed production, and several other small seed crops. The parasite directly reduces the productivity of infested crops, growing vigorously at the expense of its hosts during the summer growing season.

Golden dodder is a major pest of lucerne stands at all stages of their growth. In the Riverland, damage is greatest in established stands during summer, when dodder colonies can grow to several square metres during the 4-6 week intervals between lucerne cuts. Infestation reduces yields of forage and seed, and may reduce palatability.

Seed of golden dodder is similar in size to lucerne and some clovers, and therefore requires special techniques to grade out. The reduced yield and increased cost of cleaning may make legume seed production uneconomic. The presence of dodder seed reduces the saleability of seed crops and access to export markets. For example, although golden dodder and other weedy dodder species are already endemic in the USA, that country has a nil tolerance on any dodder seed in imports to exclude any additional dodder species.

Potential distribution

As golden dodder is a holoparasite, its habitat is created by the host plants. Its distribution is therefore determined by the availability of suitable hosts. It can grow wherever dicot weeds such as Noogoora burr with heavy biomass production over summer, or summer-growing crops such as lucerne and vegetables, grow densely.

Feasibility of Containment

Control costs

Management of dodder on productive land is expensive because it impacts on production and must be continued for years to exhaust the seed bank. It may mean taking land out of crop cultivation and using it for grass pasture.

In irrigation areas on the Murray River the first seedlings emerge in mid July or August in mild years; there is flush of seedlings in October- November with lower numbers appearing throughout the summer. However, the seedlings emerging in winter and early spring usually die due to low temperatures and inability to reach the lucerne stems directly. Although fewer seedlings germinate later, these can parasitise summer-growing weeds such as wireweed among the lucerne. From these intermediate hosts they can reach the lucerne. Golden dodder may be controlled in forage lucerne by effective control of dicot weeds that provide intermediate hosts from which the dodder seedlings climb on to the lucerne.

Locating and eradicating scattered dodder plants is labour-intensive because they are only distinctive as yellow threads on top of the hosts for a few months or less, but can form seed in a few weeks.

Persistence

Hard seed can persist in the soil under former infestations for at least 50 years. However, these seed banks are not mobile and dispersal can be prevented if infestation sites are kept free of host plants and left undisturbed.

Since 1981 extensive and ongoing monitoring has shown that golden dodder is not established beyond eradication in South Australia outside the Riverland region.

Current distribution

Golden dodder occurs throughout New South Wales and sub-tropical Queensland, and is also established in Victoria and in south-western W.A. It is more scattered in the tropics with records from northern Queensland and the Kimberlies. In South Australia it is established in the Riverland, and sporadic outbreaks have occurred in the Hills and Fleurieu and Limestone Coast regions.

Golden dodder was formerly widespread in the River Murray Valley from 7km south of Morgan to the Victorian and NSW border, growing in weedy native vegetation on river banks and on some irrigation properties. Although it has been largely controlled by a program that included the replacement of the host Noogoora burr with perennial grasses along riverbanks, seed persists in the soil at these sites.

Sporadic outbreaks have been found resulting from seed that had remained in the soil from farming operations last century, e.g. at Millbrook and the Marne Conservation Park. Other outbreaks have resulted from the inadvertent importation of contaminated seed or the movement of produce from the Riverland. These are readily eradicated when they occur in

glasshouses or intensive vegetable cultivation. Outbreaks in seed lucerne stands are less easily delimited or eradicated.

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
Irrigated pastures	very high 219	high 15	destroy infestations
Vegetables	high 168	very high 12	destroy infestations
Perennial horticulture	medium 42	high 16	protect sites
Native vegetation	negligible 4	high 21	limited action

Considerations

In the late 1970s golden dodder was found to be abundant on riparian vegetation and roadside weeds in the Riverland, and sometimes infested lucerne stands although it had been ignored by local landowners for several decades. The threat posed to the production of lucerne, irrigated crops and seed for export was evident, and in 1981 the first program to control dodder in the Riverland and survey its occurrence elsewhere in the State was initiated.

From 1987 to 1998 the former Animal and Plant Control Commission provided a State Dodder Officer who worked with the local animal and plant control boards to map and control golden dodder infestations in the Riverland. By 1998 the infestations had been reduced to a level at which they could be managed within routine declared weed control operations.

Risk assessment indicates destruction of infestations as the management action. This will be implemented by preventing further spread, containing and destroying the existing incursions.

Synonymy

Cuscuta campestris Yuncker, Mem. Torrey Bot. Club 18: 138 (1932).

Taxonomic synonyms:

Cuscuta pentagona Engelm. var. *calycina* Engelm., Amer. J. Sci. 45: 76 (1845).

Cuscuta arvensis Beyr. ex Engelm. var. *calycina* (Engelm.) Engelm., Trans. Acad. Sci. St. Louis 1: 495 (1859).

References

Cooke, D.A. & Black, I.D. (1987) Biology and control of *Cuscuta campestris* and other *Cuscuta* spp.: A bibliographic review. *Technical Paper No.18*. (Department of Agriculture South Australia: Adelaide).

South East Natural Resources Management Board & Lucerne Australia (2006) *Generic Dodder Management Plan*. 17 pp.

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