



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.

branched broomrape (*Orobanche ramosa*)

Branched broomrape is a root parasite on a wide range of broadleaf plants, lacking all chlorophyll and only appearing above ground when in flower. It has been contained in a localised area of the Murray Mallee in South Australia, but is a potential threat to irrigated pasture and crops in other parts of the State.

Apart from clover broomrape (*O. minor*) and the native broomrape (*O. cernua* var. *australiana*), other *Orobanche* species are absent from Australia and are the subject of a separate policy.

Management Plan for Branched Broomrape

Outcomes

- Minimal impact of branched broomrape on production of susceptible crops in South Australia.
- Minimal impact of branched broomrape contamination on the marketability of South Australian produce.

Objectives

- To increase the capacity of the community to effectively manage the impact of branched broomrape on agricultural production.
- Contain branched broomrape to its present distribution in the South Australian Murray-Darling Basin region.

Best Practice Implementation

- Regional landscape boards and Green Adelaide to maintain surveillance for branched broomrape, treating it as an alert weed in all regions except Murraylands and Riverland where it is established.
- New infestations of broomrape found on arable land to be reported to the regional landscape board, Green Adelaide or the Chief Executive of the Department for Environment and Water (DEW), for determination of the species.
- Owners of infested properties to prepare and implement action plans when required by their Regional landscape board.

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- Regional landscape boards and Green Adelaide to identify high risk pathways for spread of branched broomrape and ensure that management plans continue to address this risk.
- Regional landscape boards, Green Adelaide and land owners to implement best practice management (as per the PIRSA publication 'On-Property Management of Branched Broomrape').
- Land owners to take responsibility for spread mitigation measures including farm hygiene.
- Importation of produce contaminated with branched broomrape seed to be prevented.

Regional Implementation

Refer to regional management plans for further details.

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

Declaration

To implement this policy, branched broomrape 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.

Land owners are required to notify their regional landscape board or Green Adelaide of branched broomrape plants growing on their land and are responsible for destroying these plants, except in the Murraylands and Riverland region where control is required.

Branched broomrape 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 of 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 branched broomrape 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 branched broomrape. Note that certain produce or goods may be excluded from these general movement and sale exemptions by Gazettal Notice of the Chief Executive, DEW.

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Harvested grain delivered to a grain handler must also comply with Grain Trade Australia Trading Standards, which allow a maximum of two broomrape seeds per 0.5 L for certain grains.

The following sections of the Act apply to branched broomrape 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
192(2) Land owners to control the plant on their properties							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 branched broomrape.

Weed Risk

Invasiveness

Broomrape seed is produced in large quantities and shed in summer. The seeds are very small, under 0.5 mm long, but one plant can produce from 1000 to over 200 000 seeds. Due to its small size, broomrape seed is very difficult to detect in produce. It can be dispersed by livestock (both internally and externally), in soil, fodder and seed for sowing, and in mud on vehicles, machinery or footwear.

The highest risk for further spread is via soil adhering to farm and earthmoving machinery, which transfers broomrape seed directly from one paddock or roadside to another that may be kilometres away. Roadsides provide a pathway for spread on vehicles. Seed may possibly be spread by wild animals or with eroded soil blown in strong winds but the risk of these incidents is much lower.

Impacts

In other countries, *Orobanche* species in the same group as branched broomrape are major pests of some broadleaf crops and forage legumes. Its hosts include some crops of broad acre agriculture such as canola, vetch and safflower, but the heaviest impacts are on intensive cropping under irrigation, particularly *Brassica* species, carrot, tomato, lettuce and eggplant, where it reduces yields or causes crop failure. It can attach to various pasture legume such as medics, albeit at a lower incidence than more common hosts such as various daisies.

Contamination with broomrape seed has potential to impact on the marketability of certain products, with the small seeds industry at particular risk.

Potential distribution

The distribution of broomrapes is determined by the availability of suitable host plants rather than directly by environmental parameters. Branched broomrape could grow in South Australia wherever host crops are grown. In addition, it can grow on various broad-leaved weeds found throughout the agricultural zone and in the southern permanent pasture zone.

Feasibility of Containment

Control costs

Because they develop below ground, branched broomrape is not an easy target for selective herbicide control. Spot infestations can be treated by destroying the host plant with non-selective herbicides. Group B herbicides are the main tool used in cropping situations. A comprehensive guide covering options for management of branched broomrape is provided in the PIRSA publication 'On-Property Management of Branched Broomrape'.

Persistence

Seed of branched broomrape remains viable for at least 20 years, forming long-lived seed banks in the soil. As long as any host plants, including a wide range of brassicas or legumes, or daisy weeds such as Cretan weed (*Hedypnois cretica*), capeweed (*Arctotheca calendula*) and flatweed (*Hypochoeris* spp.) are present, branched broomrape can renew its seed bank annually.

Current distribution

Branched broomrape is known only from an area in the eastern Murray Mallee (mostly north-east of Murray Bridge with outlying satellite infestations). This form of branched broomrape is not known to be present in any other State, nor outside the Murraylands and Riverland region in South Australia.

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
Crop-pasture rotation	medium 57	very high 9	contain spread alert
Grazing - Southern	medium 67	very high 12	contain spread alert
Vegetables	low 31	very high 4	monitor
Native vegetation	negligible 7	very high 3	monitor

Considerations

Branched broomrape is confined to a delimited zone within South Australia. It was the subject of a nationally funded eradication program from 1997 until 2012, in which there were annual surveys, which defined the weed's extent. The program transitioned to ongoing

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management after it was determined to not be eradicable, due to the weed's geographic extent and difficulty of achieving 100% control in all land uses.

Risk assessment at the State level indicates the most strategic management actions are treating branched broomrape as an alert weed outside its current extent in the Murray Mallee, containing spread to prevent establishment in other cropping and vegetable growing regions. Although branched broomrape can grow on some suitable annual broadleaved hosts in some native vegetation communities, it has a negligible potential impact there.

These actions are implemented in the Murraylands and Riverland region to contain the spread of branched broomrape to its present distribution in the former Quarantine Zone. The other regions treat branched broomrape as an alert species, preventing entry and destroying any infestations found.

Synonymy

Orobanche ramosa L., Sp. Pl. 2: 633 (1753)

Nomenclatural synonyms:

Kopsia ramosa (L.) Dumort., Comment. Bot. 16 (1822)

Phelypaea ramosa (L.) C.A. Meyer, Enum. Pl. Cauc. 104 (1831)

Phelipanche ramosa Pomel, Nouv. Mat. Fl. Atl. 1: 103 (1874)

Taxonomic synonyms:

Orobanche mutelii F.W. Schultz, Fl. Franç. 2: 353, t. 43, f. 314 (1835)

Orobanche ramosa subsp. *mutelii* (F.W. Schultz) Cout., Fl. Portugal 566 (1913)

Kopsia ramosa subsp. *mutelii* (F.W. Schultz) Arcang., Comp. Fl. Ital. ed. 2: 417 (1894)

Phelypaea ramosa subsp. *mutelii* (F.W. Schultz) Rouy, Bull. Soc. Bot. France 55: 549 (1908)

Phelipanche mutelii Pomel, Nouv. Mat. Fl. Atl. 1: 103 (1874)

Other common names include branching broomrape, hemp broomrape, mallee broomrape.

References

Biosecurity SA (2013) *On Property Management of Branched Broomrape: A best practice manual for broadacre, horticulture, grazing, lifestyle and organic land uses*. 60pp.

Primary Industries Standing Committee (2012) *Transition to Management Plan for Branched Broomrape* 40pp.

Prider, J. (2015) The reproductive biology of the introduced root holoparasite *Orobanche ramosa* subsp. *mutelii* (Orobanchaceae) in South Australia. *Australian Journal of Botany* 63: 426-434.

Virtue, J., Prider, J. and Williams, A. (2014) Host range of branched broomrape (*Orobanche ramosa* subsp. *mutelii*) in South Australia. *Plant Protection Quarterly* 29: 46-54.

Hon David Speirs MP
Minister for Environment and Water

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