

Declared Plant Policy

under the Natural Resources Management Act 2004



Government
of South Australia

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 SA.
- Minimal impact of branched broomrape contamination on the marketability of SA 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.

Implementation

- NRM authorities to maintain surveillance for branched broomrape, treating it as an alert weed in all regions except SA Murray-Darling Basin where it is established.
- All new infestations of broomrape found on arable land to be reported to Biosecurity SA or NRM Authorities for determination of the species.
- Owners of infested properties to prepare and implement action plans when required by regional NRM authorities.
- NRM authorities to identify high risk pathways for spread of branched broomrape and ensure that management plans continue to address this risk.
- NRM authorities and stakeholders to implement best practice management (as per the PIRSA 'On Property Management of Branched Broomrape' publication).
- Promote farm biosecurity measures. Landholders 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.

NRM Region	Actions
Adelaide and Mount Lofty Ranges	Destroy infestations Alert
Alinytjara Wilurara	Destroy infestations Alert
Eyre Peninsula	Destroy infestations Alert
Kangaroo Island	Destroy infestations Alert
Northern and Yorke	Destroy infestations Alert
South Australian Arid Lands	Destroy infestations Alert
South Australian Murray Darling Basin	Contain spread
South East	Destroy infestations Alert

Declaration

To implement this policy, branched broomrape is declared under the *Natural Resources Management Act, 2004* throughout the whole of the State of South Australia so that movement of contaminated produce can be prevented. Its movement or transport on a public road by itself or as a contaminant, its entry to South Australia, or its sale by itself or as a contaminant are prohibited.

Land owners are required to notify NRM authorities of branched broomrape plants growing on their land and are responsible for destroying these plants, except in the SA Murray Darling Basin NRM 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 movement or sale can only be issued by the Chief Officer pursuant to section 188. Under the *Natural Resources Management (General) Regulations 2005*, the transport or movement of grain for milling or wool for cleaning is exempt from the operation of sections 175 and the sale of wool or grain is exempt from section 177(2) if at the time of the sale the person believes on reasonable grounds that the purchaser will remove the plant from the wool or grain before any re-sale. 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 NRM regions noted below:

Sections of Act	Region							
	AMLR	AW	EP	KI	NY	SAAL	SAMDB	SE
175(1) Prohibiting entry to area	X	X	X	X	X	X	X	X
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	X	X	X	X	X	X	X	X
182(1) Landowners to destroy the plant on their properties	X	X	X	X	X	X		X
182(2) Landowners to control the plant on their properties							X	
185 Recovery of control costs on adjoining road reserves	X	X	X	X	X	X	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 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 broadacre 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 SA 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 'On Property Management of Branched Broomrape' publication.

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 SA Murray Darling Basin NRM 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 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 SA Murray Darling Basin region to contain the spread of branched broomrape to its present distribution in the former Quarantine Zone. The other NRM 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.

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