



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.

kochia (*Bassia scoparia*)

Kochia is a shrubby annual native to eastern Europe and western Asia, with some biotypes that have become major weeds in cereal crops overseas. One of these weedy forms was imported into Western Australia in the early 1990s, prompting a successful eradication program. It is not known to be present in South Australia.

Management Plan for Kochia

Outcomes

- Grazing and cropping land protected from degradation by major weeds.

Objectives

- To prevent the establishment of kochia in South Australia.

Best Practice Implementation

- Sale, import and movement of kochia to be prevented.
- Any naturalised kochia infestation to be destroyed as found.

Regional Implementation

Refer to regional management plans for further details.

Region	Actions
Alinytjara Wilurara	Prevent entry or sale; destroy if detected
Eyre Peninsula	Prevent entry or sale; destroy if detected
Green Adelaide	Prevent entry or sale; destroy if detected
Hills and Fleurieu	Prevent entry or sale; destroy if detected
Kangaroo Island	Prevent entry or sale; destroy if detected
Limestone Coast	Prevent entry or sale; destroy if detected
Murraylands and Riverland	Prevent entry or sale; destroy if detected
Northern and Yorke	Prevent entry or sale; destroy if detected
South Australian Arid Lands	Prevent entry or sale; destroy if detected

Declaration

To implement this policy, kochia (excluding the cultivar group 'Trichophylla') 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 destroy any kochia plants 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.

Kochia is declared in category 2 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 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 kochia 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 kochia. 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 kochia 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										
192(1) Land owners to destroy the plant on their properties	X	X	X	X	X	X	X	X	X	
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

This policy is to be reviewed by 2025, or in the event of kochia becoming established as a weed in South Australia.

Weed Risk

Invasiveness

Kochia reproduces by seed only, with each plant producing 10,000-15,000 seeds in late summer. Seeds are dispersed in autumn when the dead plants break off at ground level and are blown large distances by the wind. This 'tumbleweed' mechanism can spread seeds a kilometre or more from the original site.

Most seed germinates in spring and early summer, sometimes with an autumn germination in response to late summer rains.

Impacts

Kochia significantly reduces pasture and crop production by direct competition due to its rapid growth, typically reaching 1.5 m in height and width in six months. It also produces allelopathic compounds that inhibit growth of many other plants.

In the USA, it is of some importance as a green foliage contaminant of harvested cereals.

Although palatable to stock, it may be toxic in large quantities due to its high levels of oxalates and nitrates.

Potential distribution

Kochia grows in soils from moderately alkaline to moderately acid, uses water efficiently and is adapted to warm-temperate low-rainfall habitats typical of the South Australian agricultural zone. Although a summer annual, in many years it may be able to get its roots down to the water table before the worst of the summer dry. It would also respond to summer rain on fallows.

Feasibility of Containment

Control costs

No selective broadacre herbicide treatments for kochia have been developed.

Seed germinates close to surface, making tillage when seedlings are seen one of the most effective control methods. They can also be killed with a nonselective herbicide such as glyphosate, paraquat or dicamba. Overseas, kochia has rapidly evolved resistance to sulfonylurea and triazine herbicides.

Mowing or slashing prior to flowering is effective in reducing seed production but the plants can regrow and flower later.

Persistence

The seeds are short lived in the soil, with most germinating in the first year and none remaining as a seedbank after five years.

Current distribution

Not present 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 51	very high 1	contain spread alert
Grazing - southern	medium 84	very high 1	contain spread alert
Grazing - rangeland	medium 59	very high 1	contain spread alert

Considerations

Kochia is widely naturalised as a weed in the North Temperate Zone and also in New Zealand. Due to its rapid growth and hardiness, it has frequently been seen as a potential soil stabiliser or forage plant in marginal areas.

It was first imported in 1990 and planted to rehabilitate saline agricultural land at 68 sites in Western Australia. However, it rapidly spread from these sites and was declared for eradication in 1993 when agencies realised that it was a major weed overseas. Eradication involved the use of herbicides, intensive grazing, grubbing and burning with flamethrowers.

The species *Bassia scoparia* also includes a quite different plant, the old-time garden annual known as summer cypress or burning bush. This was given the formal name of *Kochia trichophylla* Voss in a 19th century German gardening publication, but is actually a group of cultivars rather than a wild variety, and was developed as a summer-growing foliage plant that forms a compact, bright green 'shrub' and turns bright red as it senesces in autumn. Summer cypress was popular in the formal gardens of the late 19th and early 20th centuries, when there were named cultivars such as 'Childsii' within the *Trichophylla* group.

The seeds of *Bassia scoparia* are used in Japanese cuisine as a garnish called *tonburi*, and are also used in Chinese medicine to balance metabolism.

Risk assessment indicates containment as a management action; since kochia is absent from South Australia, containment is best implemented by preventing its entry to the State or establishment.

Synonymy

Bassia scoparia (L.)A.J. Scott, Feddes Repert. 89: 108 (1978)

Basionym: *Chenopodium scoparia* L., Sp. Pl. 1: 221 (1753)

Nomenclatural synonyms:

Kochia scoparia (L.)Schrad., Neues J. Bot. 3: 85 (1809)

Atriplex scoparia (L.)Crantz, Inst. Rei Herb. 1: 208 (1766)

Salsola scoparia (L.)M.Bieb., Mem. Soc. Nat. Mosc. 1: 144 (1811)

Taxonomic synonyms:

Kochia densiflora Turcz. ex Moq., Prodr. (DC.) 13(2): 131 (1849)

Kochia virgata Kostel, Ind. Sem. Hort. Prag. 77 (1844)

Suaeda sieversiana Pall., Ill. Pl. Orient. 45. t. 38 (1803)

Bassia sieversiana (Pall.) W.A.Weber, Phytologia 67: 426 (1989)

Kochia alata Bates, Am. Bot. 24: 52 (1918)

Kochia parodii Aellen, Verh. Nat. Ges. Basel 50: 151 (1939).

Other common names include Mexican fireweed, Mexican firebush, ragweed and belvedere.

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Minister for Environment and Water

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