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Southern weeds and their control

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Southern Weeds

and their control

By John Moore and Judy Wheeler



Grasses

Herbs

Vines

Trees & Shrubs

Introduction

This booklet provides easy identification of common weeds and methods of control using common cultural, biological and herbicidal control techniques. The weeds are divided into four colour coded groups based on their lifeform and are grasses, herbs, vines and shrubs or trees. Within each group, the weeds are listed alphabetically by their Latin name. A brief description of the herbicides used, a glossary and an index are included. Some species have been combined where they have similar control methods like the perennial grasses and Brassica weeds.

Other useful resources

Flora of the South West. J.R. Wheeler, N.G. Marchant and M. Lewington. Has keys, diagrams and full descriptions of plants and is available from UWA press, Nedlands.

Flora of the Perth Region. N.G. Marchant, J.R Wheeler, B.L. Rye, E.M. Bennett, N.S. Lander and T.D. Macfarlane. Has keys and descriptions.

Western Weeds. B.M.J. Hussey, G.J. Keighery, R.D. Cousens, J. Dodd and S.G. Lloyd has descriptions and photos of nearly all naturalised plants in WA. Box 190, Victoria Park, 6100.

HerbiGuide - The pesticide expert on a disk. This is a CD with herbicide, weed and control information plus electronic keys and is available from Box 44, Albany, WA, 6331. (08)98444064 or www.herbiguide.com.au

Bushland Weeds - A guide to their management. Kate Brown and Kris Brooks. Has case studies and lots of good control information and is available from DEC, Perth.

Agricultural Pesticides and Veterinary Medicines Authority website www.apvma.gov.au has herbicide registration and permit status.

Department of Agriculture website www.agric.wa.gov.au has lots of information on weeds.

FloraBase has information on the Western Australian flora. Western Australian Herbarium. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au/>

Layout

The general layout is shown on the right. The booklet is sturdy for field use. There is usually one plant per opening to allow easier copying. Most will flick through the appropriate section to identify the weed by recognition of the photographs or look up the genus name.

Acknowledgements

South Coast NRM for funding the second edition, DAFWA and DEC for time and expertise and The Weed Action Groups for continuing support of the project and members of Weed Science community for providing helpful suggestions.

Control techniques and photographs were adapted from HerbiGuide unless otherwise annotated. Graham Blacklock and Bruce Maslin kindly provided the photos marked with their initials.

Disclaimers

Read the label of herbicides for further information and registration status. Permit PER9655 allows the use of listed herbicides for the control of environmental weeds in non agricultural situations in WA until March 2012. Consult the APVMA website on www.apvma.gov.au to determine the status of permits for your situation or state. Any recommendations in this booklet do not necessarily represent the policy or support of the sponsoring organizations. People should obtain independent advice before acting on information in this publication.

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4 *Arundo donax* POACEAE

Description

Giant Reed is a very large bamboo-like grass growing in large clumps to 8 m high. It has woody stems bearing evenly spaced leaves in 2 rows. The leaves are 20-75 cm long and 4-8 cm wide with rough margins. The pale inflorescence is plume-like and feathery, 30-60 cm long. The spikelets are 8-16 mm long and have 2-7 florets. The outer segment (lemma) of each floret is silky hairy and tapers to a 2-lobed tip with a slender bristle (awn) between the lobes. Giant Reed is native to southern Europe and Asia and introduced as a garden plant or windbreak, but is now a weed along watercourses, freshwater wetlands or in moist disturbed areas. Flowers in autumn and winter. Giant Reed may sometimes be confused with Bamboo, Common Reed or Pampas Grass. Bamboo (*Arundinaria* species, *Bambusa* species and *Phyllostachys* species) has a distinct stalk-like constriction at the base of the leaves. Common Reed (*Phragmites australis*) has a brownish inflorescence with more numerous silky hairs on the spikelets and is usually found growing in shallow water.



Pampas Grass (*Cortaderia selloana*) differs in having its leaves arising from a basal tuft rather than evenly spaced along the stems.

Control

Avoid dumping garden refuse containing stems and rhizomes in areas where they may establish. Manual control is usually difficult because the rhizome must be removed. 100 mL glyphosate(450g/L) plus 25 mL Pulse® in 10 L of water applied when the reed is actively growing is the most effective control. Repeat every 12 weeks or when regrowth reaches about 20 cm tall. Mowing and grazing are usually effective if continued over a few years. Burning is more variable but useful in reducing the top growth and making it easier to apply herbicides. Selective control can usually be achieved by spraying with 5 L/ha Verdict®520 plus 1% spray oil. Use 100 mL Verdict®520 plus 100 mL of spray oil per 10 L water for hand sprays and spray until just wet. This will control the reed with little effect on broad-leaved companion species.



5 Giant Reed

Grasses

6 *Avena* species

POACEAE

Description

Tufted grasses to 1 m high. The loosely branched inflorescence has large drooping spikelets each with 2 or 3 florets. The outer segment of each floret (lemma) has a prominent bent and twisted bristle (awn)

Bearded Oat (*Avena barbata*)

The spikelets are 2-2.5 cm long. The hairs on the lemma are white and at right angles to the lemma. Native to the Mediterranean region, a widespread weed of disturbed bushland and roadsides. Flowers in spring

Wild Oat (*Avena fatua*)

The spikelets are 2-2.5 cm long. The hairs on the lemma are brownish and more appressed to the lemma surface. Native to southern Europe, a widespread weed in areas of agricultural cropping. Flowers in spring

Ludo Wild Oat (*Avena sterilis*)

The spikelets are 2-3 cm long. The lemma can be hairy or hairless. The seeds in the spikelets do not easily separate at maturity. Native to the Mediterranean region and Asia, a weed of agricultural cropping areas. Flowers in spring



Avena barbata

Control

Prevent seed set for 3-5 years.

This may be achieved by manual removal, regular mowing, grazing or spraying. Pay particular attention in spring when plants may produce seed quickly.

A grass selective herbicide is preferred in most situations. A mixture of 5 mL Targa® or Fusilade®212 (or 2 mL Verdict®520) plus 100 mL spray oil in 10 L water applied in winter before flowering will provide control of many grasses with little effect on broad-leaved species. In situations where control of all species is required use 100 mL glyphosate(450g/L) in 10 L water and spray until just wet any time the plant is actively growing. For larger areas apply 300 mL/ha Targa® (or 500 mL/ha Fusilade®212 or 100 mL/ha Verdict®520) plus 1% spray oil. In non selective situations, 2 L/ha glyphosate(450g/L) is effective. Repeat as required.



Avena fatua

7 Wild Oat

Grasses

8 *Briza* species

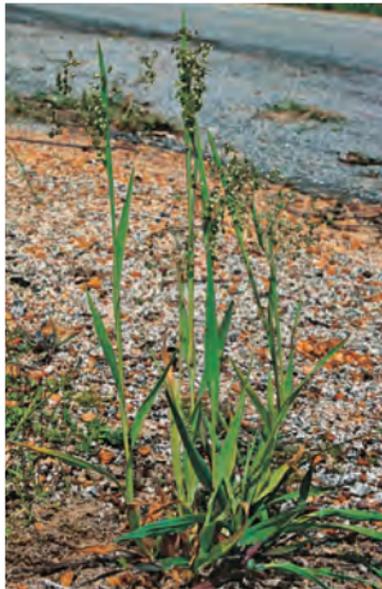
POACEAE

Description

Delicate annual grasses with a branched inflorescence of drooping spikelets each containing several overlapping florets.

Quaking Grass (*Briza maxima*) has spikelets 1-2.5 cm long, each with 7-12 florets.

Shivery Grass (*Briza minor*) is more delicate with smaller spikelets up to 0.5 cm long, each with 4-7 florets. Native to the Mediterranean and common weeds of bushland. Flowers spring and early summer.



Control

Prevent seed set for 3-4 years by hand weeding, mowing, cultivation or herbicides. Close mowing or scorching with a gas burner before flowering in spring and repeated if necessary usually provides good control. A cool burn in late spring to early summer provides reasonable control. Spray with 10 mL glyphosate(450g/L) (or 200 g Propon® plus 25 mL wetting agent) in 10 L water in late winter to early spring before flowering. Propon® is preferred for early season use as it has some residual action. Most natives will tolerate these herbicides but higher rates may cause damage. Achieve® at 4 g plus 10 mL Supercharge® oil per 10 L water will provide highly selective control and is applied between the 2 leaf and tillering stage of the grass in winter.



Blowfly Grass

9 Quaking Grass, Shivery Grass

Grasses

10 *Bromus* species

POACEAE

Description

Brome Grass (*Bromus* species)

Grasses with branched inflorescences of long and usually prominently long-awned spikelets 2-12 cm long. There are several species, now weeds of crops, wasteland and roadsides, which are native to Europe including

Great Brome (*Bromus diandrus*), **Soft Brome** (*Bromus hordeaceus*), **Madrid Brome** (*Bromus madritensis*) and **Red Brome** (*Bromus rubens*).

There is also an awnless species **Prairie Grass** (*Bromus catharticus*) from South America. Flowers in spring and summer.



B. rubens



B. rigidus



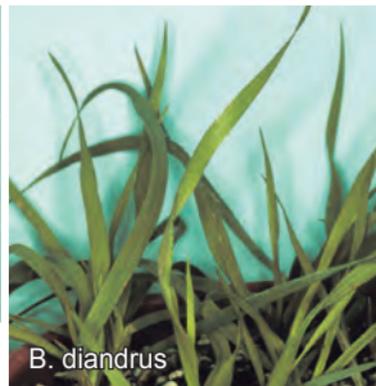
B. hordeaceus

Control

Preventing seed set for 1-2 years will provide control. Mowing and cultivation is usually effective on most species. Burning is more variable. 500 mL/ha of glyphosate(450g/L) applied when the grass is very young or flowering is fairly selective in native vegetation, cheap and effective. An early and late application may be needed where there are several grass species. For hand spraying use 5 mL glyphosate in 10 L water and spray until just wet. Many young annual grasses (except Silver Grass) can be selectively controlled with 100 mL/ha Verdict®520 or 500 mL/ha Fusilade®212 plus 1% spray oil. Use 100 mL of spray oil plus 2 mL Verdict®520 or 10 mL Fusilade®212 per 10 L water for hand spraying. Replant shrub and tree species if necessary to provide shade and help stop re-infestation.



B. hordaceus seeds



B. diandrus



B. diandrus

11 Brome Grass

Grasses

12 *Chloris truncata* POACEAE

Description

Erect grass to 50 cm high. The inflorescence is a stalked whorl of 6-9 radiating spikes each with many tiny spikelets. The spikelets each have 2 or 3 florets. The outer segment of each floret (lemma) has a straight bristle (awn). The southern extent of this WA native species, found usually in the wheatbelt and goldfields, is uncertain. It may be that its weedy nature on the south coast is indicative of it not being a native species in that area.



Control

Continual grazing often provides reasonable control. This plant spreads rapidly which makes eradication difficult unless it is practiced on a wide scale basis.

In areas threatened by invasion, spraying the road shoulders with glyphosate and spot spraying satellite infestations will reduce the rate of spread. Use 100 mL of glyphosate(450g/L) in 10 L water in early summer when the plants are actively growing or 4 L/ha on larger areas. 4 L/ha simazine(500g/L) can be used as a pre emergence treatment in early summer.



13 Windmill Grass

Grasses

14 *Cortaderia selloana*

POACEAE

Description

Tussock grass with tall plume-like spikes to 4 m high. The silver to cream-coloured inflorescence is sometimes tinged with purple, is much-branched and held high above the leaves. The leaves have very sharp margins and rough ribs. There are separate female and hermaphrodite plants, the latter are often functionally male but occasionally set seed. The inflorescence of the hermaphrodite plant is hairless and that of the female plant is silky-hairy when viewed under a hand lens. The spikelets each have 2-5 florets, the outer segment of each floret (lemma) tapering into a slender apical bristle or awn.

Native to South America, a garden escape now a common weed of wetlands, particularly around Albany. Flowers in late winter. Every effort should be made to control this plant because of the explosion in spread as seed production increases with the movement of hermaphrodite plants into the basically female Australian populations. Each seed head or plume can produce up to 100,000 seeds.



Control

Remove large plants with a backhoe, burn or bury more than 1 m deep.

Or spray until just wet with a mixture of 100 mL of glyphosate(450 g/L) plus 25 mL Pulse® in 10 litres of water. Burn when dry. Treat regrowth each spring.

Cut and burn flower heads as soon as they appear in areas where herbicides can't be used and burn and remove mother plants taking care to remove all rhizome fragments. The hermaphrodite plants produce plumes a week or two before females and priority should be given to cutting these immediately. Graze infested areas if possible or replant to native shrub species. Plants less than one year old may be controlled with a 5 mL Verdict®520 plus 100 mL spray oil in 10 L water. This mix will cause little damage to most native broad-leaved plants.



15 Pampas Grass

Grasses

16 *Ehrharta longiflora*

POACEAE

Description

Annual grass to 1.2 m high. The leaf blades have dark stem-clasping bases and a membranous tongue (ligule) between blade and sheath. The purplish green inflorescence is fairly loose with large drooping spikelets. Each spikelet is 1-3 cm long with 3 florets but only the upper one is fertile. The outer segment (lemma) of the sterile florets is tapered to a bristle up to 12 mm long.

Native to South Africa, now a widespread and common weed particularly of coastal areas and creeklines.

Flowers winter, spring and summer.



Control

Prevent seed set for 2-3 years.

Graze heavily and continually.

Mow regularly, cultivate, hand weed or use herbicides to prevent seed set.

In bushland situations, 1 L/ha Fusilade®212 plus 1% spray oil or 20 mL Fusilade®212 plus 100 mL spray oil in 10 L water applied in winter provides good control with little damage to broad-leaved species. In non selective situations, 40 mL glyphosate(450g/L) in 10 L water applied in winter or spring up to flowering provides good control. Repeat annually.

Spray-topping with 400 mL/ha glyphosate(450g/L) in spring can provide good selective control in roadside vegetation.



17 Annual Veldt Grass

Grasses

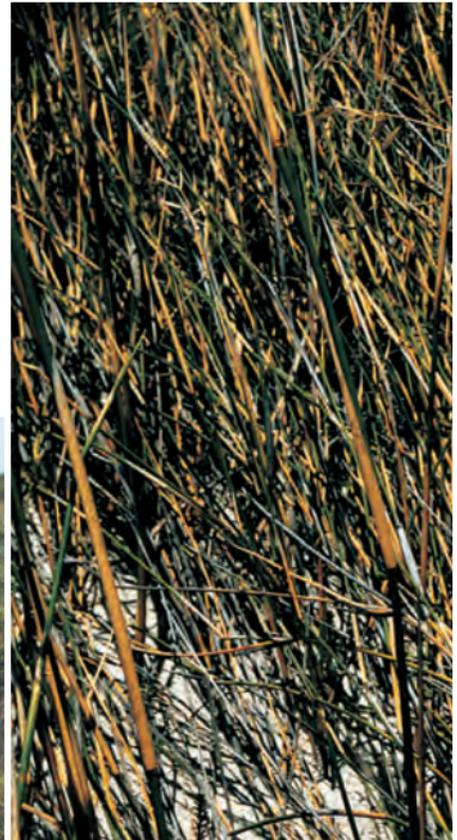
18 *Ehrharta villosa*

POACEAE

Description

A vigorous perennial grass spreading by runners, with tufted cane-like stems to 1.3 m high. The leaves are rough, frequently inrolled and with persistent leaf sheaths and a small fringe of hairs between leaf blade and sheath. The slender inflorescence is apparently one-sided. Each spikelet is 12-15 mm long with 3 florets, but only the upper smaller floret is fertile. The outer segment (lemma) of each lower sterile floret is softly hairy and tapers into a sharp point or very short bristle less than 2 mm long.

Native to South Africa, planted as a sand-binding species and now a weed of coastal sand dunes. Flowers in spring and summer but rarely sets viable seed.



Control

Selective herbicides are the best option for Pyp Grass control because they will remove the weed slowly allowing other vegetation to take over and prevent erosion.

Use 1.5 L/ha Verdict®520 plus 1% spray oil applied in spring with a back pack mister or 30 mL Verdict®520 plus 100 mL spray oil in 10 L water for hand spraying.

In non selective situations, 100 mL glyphosate(450g/L) in 10 L water applied any time the Pyp Grass is actively growing provides good control. Repeat annually.



20 *Eragrostis curvula* POACEAE

Description

A tufted grass to 1.2 m high. The greyish green inflorescence is loose and delicate, usually open and spreading with numerous small spikelets. The spikelets are 4-10 mm long, each with several florets which lack bristles.

Native to South Africa, now a serious weed of roadsides sometimes invading bushland. Flowers much of the year.

Control

Cultivation and rotational grazing usually provides reasonable control. On roadsides, spraying the shoulders with 3-4 L/ha glyphosate(450g/L) annually in winter provides good control and helps reduce spread. Grass selective herbicides generally provide little or no control. Small infestations can be sprayed at any time of the year with a mixture of 100 mL glyphosate(450g/L) in 10 L water. Repeat applications are usually required to control seedlings that emerge after spraying.

It is difficult to remove manually as it has a tough fibrous root system and tillers tend to break off and regrow.

In bushland situations, a mix of 1 L glyphosate(450g/L) in 2





L water can be used to carefully paint the centres of individual plants avoiding companion species. Control the Lovegrass for 2-3 years using herbicides and burning and then replant or encourage shrub and tree species to reduce the light levels.



21 African Lovegrass

Grasses

22 *Hordeum* species POACEAE

Description

Grasses with an unbranched bristly head of prominently long-awned spikelets 3-10 cm long. There are at least two species in the south, both native to Europe, **Barley Grass** (*Hordeum leporinum*) which is widespread as a weed of crops and roadsides and **Sea Barley Grass** (*Hordeum marinum*) a weed of disturbed and often saline sites. Flowers in spring.



Control

Prevent seed set for 1-2 years by hand weeding, mowing, cultivation or herbicides. Spray with 250 mL/ha Fusilade®212 plus 1% spray oil or 5 mL Fusilade®212 plus 100 mL spray oil in 10 L water in winter when the grass has 2-8 leaves. This treatment is very selective and does not damage broad-leaved native plants.

Alternatively in spring, spray with 10 mL glyphosate(450g/L) in 10 L water when the seed heads are just emerging. Most established natives will tolerate this treatment but higher rates will cause damage. In sensitive areas where there are seedling native or broad-leaved plants 20 mL Fusilade®212 plus 100 mL spray oil in 10 L water applied any time before flowering when the plants are actively growing will provide reasonable control of seed set.



23 Barley Grass

Grasses

24 *Lagurus ovatus*
POACEAE

Description

Annual grass to 30 cm high with softly hairy leaves. The inflorescence is a compact ovoid head, cream to yellowish green in colour. The crowded compressed spikelets are 8-11 mm long, each with a single, softly-hairy floret. The outer segment (lemma) of the floret is 2-lobed at the tip, each lobe tapering into a slender hair-like bristle (awn). The lemma also has a darker bent bristle inserted lower down.

Native to the Mediterranean region and now a widespread weed of sandy soils particularly near the coast, frequently scattered through bushland. Flowers in late winter, spring and summer.



Control

Prevent seed set for 2-3 years by mowing, grazing, cultivation, hand weeding or herbicides.

Grazing or mowing usually provides adequate control.

In sensitive areas where there are seedling native or broad-leaved plants 20 mL

Fusilade®212 plus 100 mL spray oil in 10 L water applied any time before flowering when the plants are actively growing will provide

reasonable control of seed set. The Fusilade®212 rate may be reduced to 5 mL in winter when the grass has 2-8 leaves.

Alternatively, 5 mL glyphosate(450g/L) plus 25 mL wetting agent per 10 L water applied in winter when the grass is in the vegetative stage before flowering will provide reasonably selective control in bushland. Use higher rates for higher levels of control in non selective situations.

In bushland situations, encourage shrub and tree species to reduce the light levels.



25 Hare's-tail Grass

Grasses

26 *Lolium rigidum*
POACEAE

Description

Grass with a narrow inflorescence of numerous small spikelets 4-18 mm long, which are alternately arranged up the inflorescence. Native to the Mediterranean, Annual Ryegrass is a widespread weed of roadsides. Flowers in spring. Seed heads can be infected with Annual Ryegrass toxicity and/or an Ergot that makes them toxic.



Control

Prevent seed set for 2-4 years by hand weeding, mowing, cultivation or herbicides.

Spray with 5 mL Select® (or Fusilade®212) plus 100 mL spray oil in 10 L water in winter when the grass has 2-8 leaves.

For larger plants, up to flowering, increase the rate to 20 mL. This treatment is very

selective and does not damage broad-leaved native plants. In agricultural areas, Annual Ryegrass populations may be resistant to the grass selective herbicides and glyphosate may be needed.

In winter or spring, spray with 10 mL glyphosate(450g/L) in 10 L water when the Ryegrass is vegetative to the time when the seed heads are just emerging. Most established natives will tolerate this treatment.



27 Annual Ryegrass

Grasses

28 Perennial grasses

POACEAE

Description

Water Couch (*Paspalum distichum*)

Coarse grass spreading by runners. The inflorescence is of 2 or 3 slender spreading branches each with 2 rows of small spikelets. Each spikelet is 2.5-3.5 mm long. Native to tropical and subtropical areas of the world, a weed of wetter disturbed areas, cultivation, watercourses and wet pastures. Flowers in summer.

Other **Couch** Grasses include: *Cynodon dactylon*, a softer grass with narrower leaves and the inflorescence is a whorl of radiating branches with 1-3 mm long spikelets. And *Elytrigia repens*, a slightly rough grass with similar broad leaves. The inflorescence is an erect spike with larger, 8-17 mm long, alternate spikelets.

Kikuyu (*Pennisetum clandestinum*)

Coarse grass spreading by runners. The spikelets are hidden among the leaves but the stamens can be seen when flowering as long white thread-like filaments. Native to eastern Africa, a common weed of disturbed land near settlements or pasture. Flowers in summer.



Phalaris (*Phalaris aquatica*) Tufted grass with 1 m stems carrying green cylindrical flower heads 1.5-15 cm long with numerous densely packed spikelets which are each 4-7 mm long. Native to the Mediterranean, a weed of wet disturbed areas, drains and watercourses. Flowers spring and summer.

Buffalo Grass (*Stenotaphrum secundatum*) Coarse grass spreading by runners. The inflorescence a thickened axis 4-10 cm long which has small spikelets embedded along one side. Each spikelet is 4-5 mm long. Native to tropical and subtropical areas of America and Africa, a weed of watercourses, roadsides and swamps. Flowers spring and autumn.

Control

Avoid dumping garden refuse containing these grasses in areas where they may establish. Manual control is usually very difficult. 100 mL glyphosate(450g/L) plus 25 mL Pulse® in 10 L of water applied when the grass is actively growing is the most effective control. Repeat every 8 weeks or when regrowth reaches about 5 cm tall. Mowing and cultivation are usually ineffective. Burning is more variable. Selective control can usually be achieved on these species by spraying with 800 mL/ha Verdict®520 plus 1% spray oil. Use 10 mL Verdict®520 plus 100 mL of spray oil per 10 L water for hand sprays.



30 *Romulea rosea* IRIDACEAE

Description

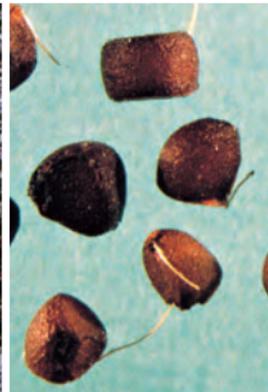
Onion Grass is a small herb with long and slender, but very tough, cylindrical basal leaves which are produced annually from a small corm. The flowers are formed at the base of the plant on stalks which gradually elongate upwards during flowering and then recurve in fruit. The star-like flowers have a short broad yellowish tube and 6 pink to purple pointed petal lobes 8-15 mm long. There are 3 stamens and a slender 6-branched style.

A weed of roadsides, garden and pasture, also commonly occurring in bushland. Onion Grass is native to South Africa and flowers in late winter and spring.

Another species, *Romulea flava*, with yellow flowers may occasionally be found.



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Control

Manual control is difficult because the corms tend to break off unless the soil is very loose. Very regular and close mowing with a rotary mower and cultivation in summer or early autumn to expose corms so they dry out and die provides some control but may also spread the infestation. Spray with 0.5 g chlorsulfuron(750g/kg) plus 25 mL Pulse® in 10 L water in winter before flowering. Larger areas can be sprayed with 20 g/ha chlorsulfuron(750g/kg) plus 0.25% Pulse®. 20 g/ha metsulfuron(600g/kg) plus Pulse® or 2 L/ha paraquat(250g/L) plus Pulse® also provides reasonable control in winter before flowering.

Blanket wiper treatments using 1-2 L/ha of glyphosate(450g/L) in combination 10-20 g/ha of chlorsulfuron or metsulfuron have also worked well.

Raptor® has shown promising results in trials and may be less damaging to bush.



31 Onion Grass
Guildford Grass

Grasses

32 *Typha orientalis* TYPHACEAE

Description

Tall rigid reed to 4.5 m high with flat strap-like leaves to 2 m long and a thick cylindrical stem. The flowering stem is tipped by a cylindrical, brown, velvety brush of densely packed tiny flowers. The upper part of the inflorescence has minute male flowers and the lower part equally small female flowers. There is a small gap between the two parts of the inflorescence. Flowers in spring and summer. Broad-leaved Cumbungi is very similar and difficult to separate from the native Narrow-leaved Cumbungi (*Typha domingensis*). Both *Typha* species are native to eastern Australia, however only Narrow-leaved Cumbungi is native to Western Australia. Narrow-leaved Cumbungi has a paler "cinnamon" brown flower spike with a narrower female part which is more distinctly separated from the male part. Both native and introduced species are found in swamps and fringing lakes and watercourses, the two sometimes growing together. As well as being very similar, intermediates between the two species have been found.



Control

Eradication is difficult because of the large seed production and the hard-to-kill, rhizomatous root system. Cultivation, mowing, physical removal, burning and herbicides are used for control. In areas with reliable frosts, autumn cultivations to expose rhizomes can provide useful control. Cutting the stems 150 mm below the water level at flowering, in late spring, results in decay of many of the rhizomes. Burning helps reduce the build up of dead plant material that clogs channels and reduces subsequent growth. In reservoirs, lowering the water level then bulldozing or burning followed by deep flooding provides cheap control. When removing by hand, ensure all the rhizomatous root is removed.

Herbicides such as glyphosate and 2,2 DPA also provide good control if 60% of the stem is above water at flowering when the herbicides are applied. Apply 100 mL glyphosate(450g/L) plus 25 mL Pulse® in 10 L water annually in late spring to summer after the male flowers have opened and before the female flowers have expanded for best results. Application at other times also provides reasonable control. Use glyphosate products registered for aquatic situations to reduce effects on aquatic organisms.



34 *Vulpia* species POACEAE

Description

Annual tufted grasses to 70 cm high with fairly narrow one-sided inflorescence of numerous stalked spikelets each with 3-12 florets. The outer segment of each floret (lemma) has a straight bristle (awn). All are native to Europe and flower from late winter to early summer. They are commonly called Silver Grass.

Squirrel-tailed Fescue (*Vulpia bromoides*)

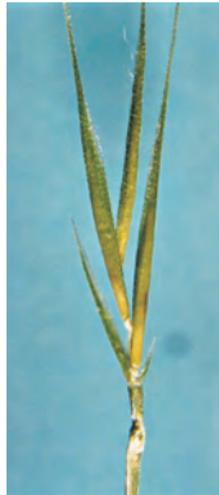
Inflorescence held well above the uppermost leaf sheath. Spikelets 1-3 cm long. Lower glume more than half the length of the upper and lemma <7 mm long. A weed of agricultural land and disturbed areas.

Sand Fescue (*Vulpia fasciculata*)

Inflorescence held only shortly above the uppermost leaf sheath. Spikelets 2.5-4.5 cm long. Lemma >7 mm long. A weed of disturbed areas.

Rat-tailed Fescue (*Vulpia myuros*)

Inflorescence held only shortly above the uppermost leaf sheath. Spikelets 1.5-2.5 cm long. Lower glume less than half the length of the upper and lemma <7 mm long. A weed of agricultural land and disturbed areas.



Control

Prevent seed set for 2-3 years by mowing, cultivation, hand weeding or herbicides. 5 mL glyphosate(450g/L) plus 25 mL wetting agent per 10 L water applied in winter before flowering will provide reasonably selective control in bushland. Use higher rates for higher levels of control in non selective situations. 10 mL simazine(500g/L) per 10 L of water applied before the Rat-tailed or Squirrel-tailed Fescue emerges or up to the 4 leaf stage in early winter will provide good control with little damage to most established native species. Simazine is not very effective on Sand Fescue. The grass selective herbicides such as Fusilade® and Verdict® have little effect on these grasses.



36 *Acetosella vulgaris*

POLYGONACEAE

Description

Slender herb, often reddish tinged. The acid-tasting leaves are arrow-shaped, 2-5 cm long with a pointed tip and two basal lobes. The tiny reddish tinged flowers are arranged in whorls up the slender flower spikes, each flower with floral segments only 2 mm long. The male and female flowers are on separate plants, the male flowers with 6 stamens and the female flowers with 3 fringed style tips. The nut-like fruit is enclosed between the enlarged inner 3 floral segments. Native to Europe and Asia, Sorrel has become a problem weed of pastures, roadsides and waste places. Flowers in autumn, spring and summer. Previously known as *Rumex acetosella*.



Control

Manual removal is extremely difficult and attempts often lead to greater infestations.

In bushland areas, hand spray with a mix of 0.2 g metsulfuron(600g/kg) plus 25 mL Pulse® in 10 L water in winter or spring. On small areas, add 0.5 g Oust® for residual control of seedlings and rhizomes. This mix will kill most broad-leaved seedlings. Repeat annually if plants appear. One year after the last spray replant to tall growing perennial species. 50 mL glyphosate (450g/L) in 10 L water applied in winter is reasonably effective but rarely provides eradication. Mowing and grazing are ineffective. Cultivation in spring/summer provides some control as it dessicates the root system. Dicamba and Tordon®242 are also used in crops.



38 *Agapanthus praecox* ALLIACEAE

Description

Agapanthus is a stemless perennial herb with a large basal tuft of dark green shiny leaves. The leaves are linear, strap-like and somewhat arching, 20-80 cm long and 2-6 cm wide. The blue to purple or white flowers are clustered in a large globular flower head 10-15 cm across which is held high above the leaves on a stout shiny stalk to 1 m high. The individual flowers have 6 petals 4-6 mm long and 6 stamens. The fruit is a greenish capsule.

Native to South Africa, *Agapanthus* is a common garden plant, now a weed of high rainfall areas along roadsides particularly near settlements, urban bushland and granite outcrops. Flowers in spring and summer.

The leaves of Kangaroo Paws (*Anigozanthos* species) are dark green often mottled with dark brown to black markings and 2-25 mm wide. The inflorescence of the Kangaroo Paw is branched and has fan-shaped flowers which are densely woolly. Easter Lily (*Amaryllis belladonna*) has white to pink flowers in autumn and narrower channelled leaves in a less



dense basal tuft. Chincherinchee (*Ornithogalum thyrsoides*) also has fewer basal leaves arising from a bulb and heads of white flowers whose petals have a dark blotch.

Control

Cultivation, mowing and grazing provides control.

Manually Remove tops and root system and burn or bury more than 1 m deep.

Spray with 20 mL Access® mixed with 1 litre of diesel or wipe leaves with Tordon® or Vigilant® Gel herbicide. Avoid dumping garden rubbish on sites where establishment may occur.

Glyphosate is not very effective on this plant.

Rarely invades agricultural situations.

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40 *Allium triquetrum* ALLIACEAE (LILIACEAE)

Description

A tuft of soft basal leaves arise annually in late winter from a bulb. The 3-angled leaves may be up to 45 cm long and have a characteristic “onion” or “garlic” smell when crushed. The flowering stem, also distinctly 3-angled, is unbranched and topped by a cluster of white drooping bell-like flowers. The flowers are on slender stalks and have 6 white petals 1-2 cm long, each with a prominent green midline. Each flower has 6 stamens and a style which is 3-branched at the tip.

Native to the Mediterranean Region, now found in damp areas, frequently near creeks or granite rocks around Albany and the south west. Three-cornered Garlic is a potentially serious weed as it is capable of dominating the understorey. Flowers in late winter and early spring.

Another weed appearing similar, False Onion weed (*Nothoscordum gracile*), may be found on waste land near Albany, but has cylindrical flower stalks and lacks the onion-like smell.

Native plants which may be confused with Three-cornered Garlic are few, but possibly are:



Milkmaids (*Burchardia umbellata*) which has a few flat basal leaves, one or two stem leaves and slightly smaller more open flowers. It may be found from Two Peoples Bay westwards. Vanilla Lily or Purple Tassels (*Sowerbaea laxiflora*), usually with purple to pink flowers but very occasionally white, is a tufted plant with fibrous roots rather than a bulb and a few stem leaves. It has smaller flowers with 3 stamens. Vanilla Lily may be found from Albany, Mt Barker and the Kalgan River westwards.

Control

Manually remove isolated plants and crush or burn the bulbs. Cultivate in summer to expose bulbs. Spraying in late winter to early spring, before flowering, with 0.5 g of metsulfuron(600g/kg) plus 25 mL Pulse® in 10 L water provides good control. This will damage many broad-leaved species. Repeat for 2-3 years and replant 1 year later if necessary. Regular mowing also provides control.



41 Three-cornered Garlic

Herbs

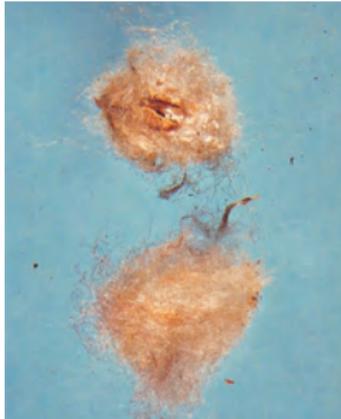
42 *Arctotheca calendula* ASTERACEAE

Description

An annual daisy with a flat basal rosette of deeply lobed leaves. The leaves are 3 to 25 cm long, green on the upper surface but the lower surface white-hairy. The daisy flower heads, up to 6 cm in diameter, are held on individual stalks, with the radiating petal-like florets yellow and the tiny central florets black. Tiny woolly fruits are topped by minute scales.

A common weed of pastures, crops and roadsides, but also quite common in disturbed bushland. Native of South Africa.

Flowers in late winter and spring.



Control

In Clover pastures, spray-grazing with 500-1000 mL/ha of 2,4-D amine(500g/L) in winter or spray-topping with 500 mL/ha paraquat(250 g/L) at budding in spring for a number of years will lead to very low levels. In crops there are a number of post emergence options. Lontrel® and terbutryn are preferred because they have some soil residual action. In grass areas, picloram containing products provide long term control. In bushland, 120 g/ha Lontrel®750 or 2 g plus 25 mL of wetting agent in 10 L water will provide good control and is safe on many native species. Glyphosate(450g/L) at 500-1000 mL/ha or 10 mL in 10 L of water is also fairly selective in bushland and roadside situations if applied when young or at the budding stage. Manual removal before flowering is effective. Mowing is only effective if repeated regularly and close to the ground. Cultivation can be variable as Capeweed transplants readily in wet conditions. Grazing is ineffective. Replant shrub and tall species to reduce light levels.



44 *Asphodelus fistulosus* ASPHODELACEAE

Description

Tufted herb with hollow somewhat succulent cylindrical leaves 18-40 cm long. The erect flowering stem may be up to 60 cm tall, branched with many small flowers. The flowers have 6 petals 7-12 mm long, each petal with a brownish or purplish central stripe. There are 6 stamens with dark brown anthers and a slender style which is minutely 3-lobed at the tip.

Native from southern Europe to India, Onion Weed is a weed of roadsides and railway verges, but is invading nearby bushland, particularly in drier areas. Onion Weed is a common roadside weed from Albany to Esperance and north to Kojonup. Flowers in winter and spring.

Control

Manually remove isolated patches before flowering. Cultivate in summer to kill old plants and repeat in the following summer to control seedlings that have established. Wick or blanket applicators and sponge gloves using 5 g of metsulfuron(600g/kg) or 500 mL of glyphosate(450g/L) plus



2.5 mL wetting agent per litre of water are useful in sensitive areas. Larger areas can be sprayed with 5 g/ha metsulfuron(600g/kg) or 0.1 g metsulfuron(600g/L) plus 100 mL spray oil in 10 L water. Apply before flowering in winter or spring. Replant shrub and tree species about a year after the last overall spray of metsulfuron. Eradication will take a number of years because of the dormant seed bank in the soil. Basta® or Spray. Seed® at 2 L/ha are also useful in non selective situations.



45 Onion Weed

Herbs

46 Brassicaceae Weeds

BRASSICACEAE

Description

These plants are characterised by a basal rosette of stalked leaves which are lobed or toothed and often bristly. The stem leaves are smaller. They have white to yellow (or occasionally pink to mauve) 4-petalled flowers, each with 6 stamens. The main diagnostic aid to identification within this group is the seed pods.

All are native to Europe and Asia and have become common weeds of roadsides and disturbed areas near cultivation but not often invading bush. Most flower from autumn to spring. Most of the native Brassicaceae species have short, broad and smooth pods whereas the weedy species (except Hedge Mustard and Turnip Weed) have long slender pods.

Canola (*Brassica napus*)

Seed pods slender, smooth, 4.5-10 cm long, almost cylindrical with several seeds. The narrower tip (beak) lacks seeds. Seed pods remain entire and do not break into smaller pieces. The yellow petals are 11-14 mm long and the leaves a more bluish green than the Turnips.



Mediterranean Turnip (*Brassica tournefortii*)

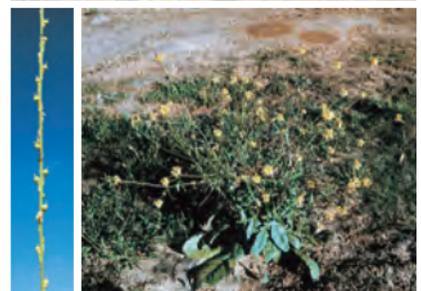
Seed pods as for Canola but 3-7 cm long and the flowers smaller with pale yellow to white petals, 5-8 mm long. Leaves are more bristly than those of Canola. It is commonly referred to as Wild Turnip.

Wild Radish (*Raphanus raphanistrum*)

Seed pods are 2-9 cm long, ribbed and distinctly constricted between the seeds and break up into single-seeded pieces at maturity. The narrow conical tip (beak) lacks seeds. Flowers are white, yellow or pink to mauve.

Turnip Weed (*Rapistrum rugosum*)

Seed pods small and broad, 0.5-1 cm long composed of two segments, a small cylindrical basal segment and a spherical ribbed upper segment with a tiny narrow tip. Each segment usually contains a single seed.



48 Brassicaceae Weeds

BRASSICACEAE

Hedge Mustard (*Sisymbrium officinale*)

Seed pods short and conical, 0.8-2 cm long, held close to the stem.

Indian Hedge Mustard (*Sisymbrium orientale*)

Seed pods very long and slender, 4-10 cm long and spread out from the stem.

Wall Rocket (*Diplotaxis muralis*)

Annual or biennial herb to 0.5 m high with stems bristly towards the base and a basal rosette of leaves. The petals are 4-9 mm long. The seed pods are 2-4 cm long. Scattered from Shark Bay to Esperance. Flowers summer to early spring.

Sand Rocket (Lincoln Weed) (*Diplotaxis tenuifolia*)

Perennial, aromatic herb to 1.3 m high with hairless stems, the basal leaf rosette usually absent. The flowers have larger petals 8-12 mm long. The seed pods are 2-6 cm long. Scattered localities, Perth, Bunbury, Albany and Esperance. Flowers summer and autumn.



Control

Most of the Brassicaceae weeds have dormant seeds that will continue to germinate over the season and for several years. They often mature and set seed very quickly. Manual removal is effective but must be done at least every 8-10 weeks. Once pods are formed, seed will often mature even if the plant has been uprooted. Soil disturbance often leads to a flush of seedlings.

Many are somewhat unpalatable, so grazing only offers partial control. They often flourish in undergrazed situations.

In bushland situations, fairly selective control can be achieved with 100 mL spray oil plus 0.1 g Eclipse® or 0.5 g Logran® in 10 L water. 5 mL Brodal® is often added to this mix to provide residual control of seedlings. Spray the plants until just wet from the seedling stage up to podding.

Isolated plants should be removed manually and burnt if flowering or seeding and a 10 m buffer area sprayed with 10 mL Brodal® in 10 L water.

500 mL/ha of glyphosate(450g/L) can be used at flowering of most species to reduce seed set on roadsides without causing significant damage to most native species.

Wick application with 1 part glyphosate(450g/L) in 2 parts water or overall spraying with 100 mL glyphosate(450g/L) in 10 L water provides reasonable control of most species though Wild Radish tends to regrow.

Metsulfuron tends to provide variable control at low rates.

50 Brassicaceae Weeds
BRASSICACEAE



Alyssum linifolium



Cardamine hirsuta



Raphanus raphanistrum



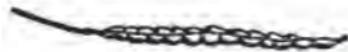
Brassica barrelieri ssp oxyrrhina



Cardaria draba



Rapistrum rugosum



Brassica fruticulosa



Carrichtera annua



Rorippa nasturtium-aquaticum



Brassica juncea



Coronopus didymus



Sinapis alba



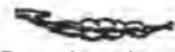
Brassica napus



Diplotaxis muralis



Sinapis arvensis



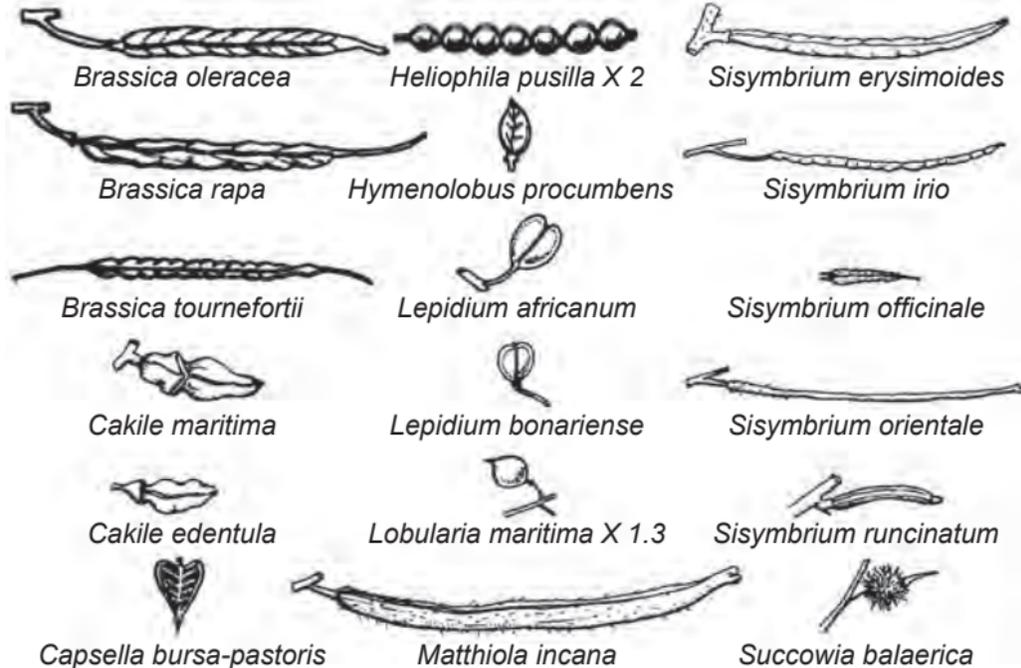
Brassica nigra



Diplotaxis tenuifolia



Scale in cm except where magnification shown



Courtesy Louise Burch, Western Weeds

51 Brassicaceae Weeds

Herbs

52 *Carduus* species ASTERACEAE

Description

Slender Thistle (*Carduus pycnocephalus*) has discontinuously winged spiny stems. The flowerheads are 10-15 mm wide and arranged in clusters of 1-3 heads. The seeds have about 20 ribs.

Winged Slender Thistle or Sheep Thistle (*Carduus tenuiflorus*) has continuously winged spiny stems. The flowerheads are 8-10 mm wide and arranged in clusters of 3-10 heads. The seeds are smaller with 10-13 ribs. Both have spiny-lobed leaves with cobwebby hairs. The purple flower heads are clustered and the bristles topping the fruits are only very minutely barbed. They originate from Europe and are common weeds of pasture, roadsides and disturbed bushland. Flowers in spring and early summer.



Control

Prevent seed set for several years. Mowing or preferably slashing before the bud stage is effective if it is repeated to control new regrowth. Seeds can develop from reserves in the stem if substantial amounts of stem remain attached to the buds. Manual removal is also effective but often unpleasant due to the spiny nature of the plant. Blanket wipers or wick applicators using 1 part glyphosate(450g/L) to 2 parts water or spot spraying with 50 mL glyphosate(450g/L) in 10 L water can provide partially selective control. Overall spraying with 200 g/ha Lontrel®750 (or 4 g in 10 L for spot sprays) provides reasonably selective control in bushland situations. Spray grazing when young with 500 mL/ha 2,4-D amine(500g/L) provides cheap control in pasture and partial control in bushland. As these thistles are annuals, control of the seed bank is the key to success. Control neighbouring infestations to reduce spread by birds. Wind rarely takes seed more than 100 metres from the parent plant. Replant to ground covering species and avoid disturbance to reduce the bare areas present at the break of the season. Cultivation is effective. Grazing with sheep to reduce pasture then grazing with goats at flowering provides good control in 3 years.



53 Slender Thistles

Herbs

54 *Carthamus lanatus* ASTERACEAE

Description

The stems are not winged nor spiny. The leaves are rigid and prominently veined, have cobwebby hairs, are spine-tipped and the margins spiny-toothed. The cream to yellow flower heads are single and the fruits are topped by slender scales. Saffron Thistle is native to Europe. A weed of crops, pasture and waste ground. A declared noxious weed. Flowers in summer.

Control

Prevent seed set for several years. Mowing is effective if done before flowering and repeated to prevent flowering. Manual removal is effective for small areas but often unpleasant due to the spiny nature of the plant. Blanket wipers or wick applicators using 1 part glyphosate(450g/L) to 2 parts water can provide partially selective control. Spray grazing with 750 mL/ha 2,4-D amine(500g/L) when young or spray topping with 400 mL/ha glyphosate(450g/L) plus 400 mL 2,4-D ester(800g/L) at early flowering provides cheap control in annual pasture. Control seed set by applying 1 L/ha paraquat(250g/L) plus 1% spray oil or 20 mL paraquat(250g/L) plus 100 mL spray oil in 10 L water for hand spraying at the bud stage. This severely scorches companion species, however most perennial species will regrow with little long term effect. Lontrel®750 at 200 g/ha or 4 g



per 10 L water gives reasonably selective control of young plants in bushland. Control neighbouring infestations to reduce spread by birds. Wind rarely takes seed more than 100 metres from the parent. Grazing with sheep to reduce pasture then grazing with goats at flowering provides good control in 3 years.



55 Saffron Thistle

Herbs

56 *Centranthus ruber* VALERIANACEAE

Description

Red Valerian is a perennial herb to 0.7 m high with greyish foliage. The leaves are opposite, egg-shaped to elliptic with a pointed tip, 2-12 cm long and 4-50 mm wide, usually entire. The pink to red (occasionally white) flowers are in clusters arranged in terminal sprays. Each flower is narrowly tubular with 5 unequal spreading lobes, a basal spur and only 1 stamen. One of the petal lobes is slightly larger and somewhat separated from the remaining 4 which are arranged like a fan. The fruit is nut-like and topped by a feathery crown.

Native to south east Europe, now a weed of disturbed areas and granite outcrops. Flowers spring to early autumn.

Pretty Betsy (*Centranthus macrosiphon*) has toothed leaves and a smaller corolla spur up to 1.5 mm long (4-8 mm long in Red Valerian) and a shorter fruit crown 3 mm long (5-8 mm long in Red Valerian). The Common Valerian (*Centranthus officinalis*) has pale lilac flowers and toothed leaves.

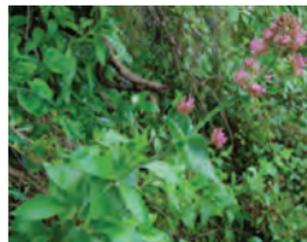


Control

Manual removal is effective for small areas providing the roots are also removed with a fork. Plants will reshoot from the base if they are broken off. Seedlings can be easily hand pulled. Regular mowing, cultivation or grazing over a number of years provides reasonable control. Blanket wipers or wick applicators using 1 part glyphosate(450g/L) to 2 parts water can provide partially selective control. Spot spraying with 50 mL glyphosate(450 g/L) in 10 L water provides good control. Logran® at 40 g/ha or Lontrel®750 at 500 g/ha (10 g per 10 L water) gives reasonably selective control of young plants in many bushland situations.

Wind rarely takes seed more than 100 metres from the parent plant.

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57 Red Valerian

Herbs



58 *Chasmanthe floribunda*

IRIDACEAE

Description

Tufted herb, similar to *Watsonia* and *Crocosmia*, with erect sword shaped leaves to 1 m long produced annually from a corm. The flowering stem is tall and spike-like with many large orange or yellow irregularly shaped flowers which curve downwards and in which one petal is much longer than the others. It has a 3-branched style and fleshy orange seeds. Native to South Africa, this weed of the south coast flowers from winter to spring. Native plants which (when not flowering) may be confused with *Chasmanthe* are: Kangaroo Paws (*Anigozanthos* species) with darker green, fleshier, unribbed leaves, the older leaves often mottled with dark unsightly markings. The dried remains of flower spikes are broad and branched in the common south west Tall Kangaroo Paw (*Anigozanthos flavidus*). *Patersonia* and *Orthrosanthus* species have leaves which are generally narrower and often bearing a few marginal hairs.



Control

Grazing provides effective control. Cultivation to 100 mm provides good control if done after the old corm is exhausted and before the new corms form or before the flower stem emerges. A follow up cultivation is usually needed. Mowing and slashing are usually ineffective unless repeated very regularly. Dig up isolated plants and burn the bulbs. Thick infestations are difficult to control manually. 100 g 2,2-DPA(740g/kg) plus 25 mL wetting agent in 10 L of water is the preferred herbicide because it is more selective than 100 mL glyphosate(450g/L) plus 25 mL wetting agent per 10 L water and provides some residual control of seedlings. Apply from flower stem emergence to mid flowering for the best control. Use a sponge glove with 1 L glyphosate(450g/L) plus 2 L water for sensitive areas. Eradication from an area can usually be achieved in 2-3 years. Replant shrub and tree species.



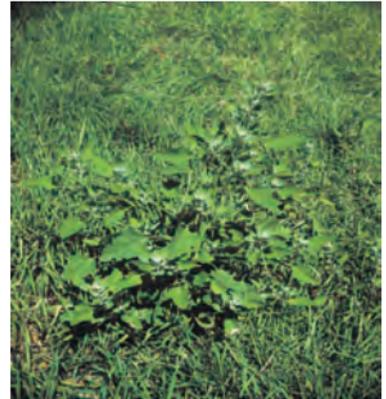
60 *Chenopodium album* CHENOPODIACEAE

Description

Erect annual herb to 1 m high usually with striped stems. The leaves are elliptic to diamond-shaped, 20-60 mm long and 5-30 mm wide with a pointed tip, the lower leaves sometimes with angular teeth. Upper surface of leaf is green, the lower surface mealy white. There are dense clusters of tiny green flowers which are each 1.5-2.5 mm across and have 5 floral segments and 5 stamens. The tiny fruits are held horizontal in the floral segments.

Native to Europe, Fat Hen is a weed of horticulture and often found on waste land. Flowers in spring and autumn.

Fat Hen differs from Small Crumbweed (*Chenopodium pumilio*) in its erect habit and its larger more angular leaves with minute mealy-white hairs.



Control

Hand pull plants after elongation and before seeding in summer. It is relatively tolerant to normal rates of glyphosate. For small areas use 2 L/ha Spray.Seed® plus 4 L/ha simazine(500 g/L) plus 1% spray oil in early summer for control of existing plants and residual control of seedlings for the season. This mix is not recommended for hand spraying. In bushland areas, use 4 L/ha 2,4-DB(400g/L) or 80 mL 2,4-DB plus 25 mL wetting agent in 10 litres of water in early summer on young actively growing plants for reasonably selective control. In areas where hormone herbicides are restricted use 25 g/ha Broadstrike® plus 0.5% Uptake® or 0.5g Broadstrike® plus 50 mL Uptake® in 10 L water on young plants. A repeat application may be required in years where summer rains induce late germinations. Grazing normally provides control and it often flourishes in areas that have recently been fenced off.

61 Fat Hen

Herbs



62 *Chenopodium pumilio* CHENOPODIACEAE

Description

Annual herb to 0.3 m high with a minty odour and often incorrectly called Mintweed or Goosefoot. It is sometimes erect but often sprawling or ground-hugging. The leaves are elliptic to circular, 3-30 mm long and 2-15 mm wide with a rounded tip, either entire, wavy or with shallow rounded lobes. Upper surface of the leaf is green, the lower surface with both twisted hairs and tiny yellow gland-tipped hairs. There are dense clusters of tiny green flowers which are each 0.5-1 mm across and have 5 floral segments.

The stamens usually reduced to 1 but may be absent in some flowers. The tiny fruits are held vertically in the floral segments which separate slightly to expose the fruit. It flowers mainly in autumn.

A W.A. native species widespread throughout Australia which has become a weed of pastures, gardens and agricultural land.

Small Crumbweed differs from Fat Hen (*Chenopodium album*) in its smaller more rounded leaves with both twisted and gland-tipped hairs rather than dry mealy hairs.



Control

Hand pull plants after elongation and before seeding in summer. It is relatively tolerant to normal rates of glyphosate. For small areas use 2 L/ha Spray.Seed® plus 4 L/ha simazine(500g/L) plus 1% spray oil in early summer for control of existing plants and residual control of seedlings for the season. This mix is not recommended for hand spraying. 500 mL/ha of atrazine(500g/L) plus 1% spray oil provides good control where its use is permitted.

In bushland areas, use 4 L/ha 2,4-DB(400g/L) or 80 mL 2,4-DB plus 25 mL wetting agent in 10 litres of water in early summer on young actively growing plants for reasonably selective control. In areas where hormone herbicides are restricted use 25 g/ha Broadstrike® plus 0.5% Uptake® or 0.5g Broadstrike® plus 50 mL Uptake® in 10 L water on young plants. A repeat application may be required in years where summer rains induce late germinations. Even though it is occasionally toxic, grazing usually provides reasonable control and it often flourishes in areas that have recently been fenced off.



64 *Cirsium vulgare*
ASTERACEAE

Description

Spear Thistle has narrowly winged spiny stems. The hairy leaves are deeply dissected and spiny. The purple flower heads are up to 4 cm in diameter (larger than those of the Slender Thistles) and are single or occasionally clustered. The fruits are topped by soft feathery bristles. Native to Europe and western Asia, Spear Thistle is a common weed of pasture, roadsides, waste land and disturbed bushland. Flowers from late winter to summer.



Control

Prevent seed set for several years. Mowing is not very effective because the plant tends to survive on the rootstock. Manual



removal is effective for small areas but unpleasant due to the spiny nature of the plant. Blanket wipers or wick applicators using 1 part glyphosate(450g/L) to 2 parts water can provide partially selective control. Overall spraying with 200 g/ha Lontrel®750

or 4 g Lontrel®750 plus 25 mL wetting agent in 10 L water provides reasonably selective control in bushland situations. Spray grazing when young with 1 L/ha 2,4-D amine(500g/L) provides partial control in pasture. Replant shrub species to increase shading. Isolated plants can be removed manually and a 5 metre buffer around the plant sprayed until just wet with 50 mL Tordon®75-D in 10 L water to help control emerging seedlings. This will damage most young broad-leaved species. Cultivation is effective. Grazing with sheep to reduce pasture then grazing with goats at flowering provides good control in 3 years.



65 Spear Thistle

Herbs

66 *Conyza* species ASTERACEAE

Description

Annual herbs with a basal rosette of entire or toothed leaves and an erect, often greyish, leafy flowering stem. The small flower heads are cream to white and do not have the radiating petal-like florets seen in many daisies. Instead there are several slender tubular florets. Tiny fruits are topped by a ring of bristles. 3 species are likely to be found along the south coast and all are common weeds of roadsides and disturbed bushland. All flower in summer and autumn.

Tall Fleabane (*Conyza albida*) may reach 2 m high, is usually unbranched below the inflorescence and has hairy leaves. Native to North America.

Flaxleaf Fleabane (*Conyza bonariensis*) usually to 1 m high and usually branched with greyish hairy leaves. Native to North

America. Fleabane (*Conyza parva*) has almost hairless leaves and smaller flowerheads. Native to South America.



Control

Spray road shoulders with 2-3 L/ha glyphosate(450g/L) in early summer to reduce spread of seed in the slipstream of traffic. On other areas, apply 1 L/ha glyphosate(450g/L) after stem elongation and before flowering when the plants are actively growing in late spring to summer each year.

A mixture of 1 L glyphosate(450g/L) plus 2 L water can be used to wipe the stems of plants. Lontrel®750 at 200 g/ha or 4 g plus 25 mL wetting agent in 10 L water can be used for fairly selective control in bushland. Isolated patches can be sprayed with a mixture of 50 mL Tordon®75-D in 10 L water for control of plants and residual control of seedlings. Hand pulling after stem elongation is effective on loose soils, but on heavier soils a weed fork is required to prevent the plant breaking and regrowing from the base. Mowing is not effective.

Planting perennial species to increase ground cover and shade will help reduce re-infestation. Continuous grazing usually gives adequate control.



68 *Dittrichia graveolens*
ASTERACEAE

Description

Sticky erect annual herb with an unpleasant smell when crushed. It has a greatly branched leafy flowering stem to 50 cm high arising from a basal rosette of leaves. The small flower heads are yellow, with small outer radiating petal-like florets. The tiny fruits are topped by a ring of bristles. Originating from the Mediterranean region, it is now a common weed of pasture, roadsides and waste land. Stinkwort can cause stock losses and may cause dermatitis. Flowers in late summer to early winter.

Control

Small areas can be mechanically removed. Plants in flower must be burnt as seed will develop from the reserves in the stem if left on the ground. Heavy grazing (with older wethers) provides some control of young plants. Cultivation of larger plants is only effective if done before flowering. Mowing reduces seeding but is effective only if they are cut very close to the ground and



repeated. Regrowth often occurs if adequate soil moisture is present. It is relatively tolerant of glyphosate, metsulfuron and hormone herbicides but spray-grazing young plants with 2,4-D can provide useful control. Thick stands of Stinkwort reduce winter pasture growth which helps conserve moisture for Stinkwort growth next summer. Control programs should also address soil nutrient deficiencies, water tables and salinity. Planting species to consume summer moisture and controlling pests and diseases of competing companion species also helps control. Infestations up-wind or up-stream may need to be controlled to prevent re-infestation. Young plants can be controlled with 2 L/ha 2,4-D ester(800g/L) plus 1% spray oil or 40 mL 2,4-D ester(800g/L) plus 100 mL spray oil in 10 L water. Older plants are more difficult to kill and a mix of 100 mL 2,4-D ester(800g/L) plus 4 g Lontrel®750 plus 100 mL spray oil in 10 L of water will be needed for reasonable control.



69 Stinkwort

Herbs

70 *Echium plantagineum* BORAGINACEAE

Description

A coarse, bristly herb up to just over 1 m high. The branched and leafy flowering stem arises from a basal rosette of entire oblong leaves. The basal leaves are up to 20 cm long but those up the stem are smaller and somewhat stem-clasping. The flowering stem bears clusters of blue to purple flowers. Each flower is broadly funnel-shaped with 5 somewhat unequal and irregularly shaped petal lobes and 5 stamens. Occasionally white or pink to reddish flowers may occur.

Common weed of agricultural land and roadsides. Native to Europe. Flowers late winter and spring.

Control

Isolated plants can be manually removed and burnt if flowering or seeding. Graze heavily with wethers over spring to reduce seed production. Shear sheep and allow up to 7 days for seed to pass through stock before introducing them to clean areas. Spray graze pasture with 500 mL/ha Tigrex® in early winter before the weed has reached the 6 leaf stage and repeat if necessary. Spray top at flowering with 1 L/ha paraquat(250g/L) and repeat if necessary. Blanket wipers applying 5-10 g/ha metsulfuron(600g/



kg) or chlorsulfuron(750g/kg) or 1 L/ha paraquat provide good selective control in spring. For odd plants, spray leaves until just wet and a 10 m buffer area with a mixture of 100 mL Tordon®75-D in 10 L of water. This will kill most broad leaf plants, but not grasses, and leaves a residual herbicide in the soil that controls seedlings for about a year. For larger areas spray with 0.5 g chlorsulfuron(750g/kg) plus 25 mL wetting agent in 10 L water in winter. This will also control seedlings for several weeks. Cultivation controls existing plants but tends to encourage a new germination. Winter grazing tends to increase infestations. Glyphosate and metsulfuron provide good control of existing plants. Several biocontrol insects provide varying degrees of control with the Crown Borer producing the most damage.



71 Paterson's Curse

Herbs

72 *Emex australis* POLYGONACEAE

Description

Ground-hugging or sprawling herb with ovate leaves 2-7 cm long. The greenish inconspicuous flowers are in small clusters. The flowers are unisexual but both male and female flowers occur on the same plant. The male flowers have 5 or 6 tiny floral segments and 4-6 stamens. The female flowers are 6-lobed and have 3 styles. The fruit is woody with 3 rigid sharp spines.

Native to South Africa, Doublegee is a declared pest plant and is a widespread serious weed in agricultural areas and on waste land. Flowers in spring.



Control

Manually remove isolated plants and burn them. Spray a 10 m area around them with a mixture of 100 mL of Tordon®75-D in 10 L of water to help control seeds germinating later in the season.

Small areas should be fenced off to prevent stock, people and vehicles spreading the seed.

In bushland areas, wipe actively growing plants with a mixture of 1 L glyphosate(450g/L) plus 2 L water. For small areas, apply a mixture of 0.5 g metsulfuron(600g/kg) plus 100 mL Tordon®75-D to actively growing plants before flowering. Inspect areas 3 times a year for several years and repeat control if seedlings emerge. 50 mL glyphosate(450g/L) in 10 L water applied before flowering kills existing plants but tends to leave the area

bare and often leads to greater infestations of Doublegee. Young plants can be manually removed but older plants tend to break off and regrow. Doublegee produces seed very quickly so early control is essential. Larger areas in bushland can be selectively controlled with 1 g Broadstrike® plus 100 mL spray oil in 10 L water when the plants are young and repeated every 8 weeks if necessary.



73 Doublegee, Spiny Emex

Herbs

74 *Erodium* species

GERANIACEAE

Description

Sprawling herbs to 40 cm high, with stalked leaves which are either deeply dissected or pinnately divided (like a feather) into separate leaflets. The flowers are in stalked clusters, each flower with 5 free petals. There are 5 fertile stamens and 5 small antherless filaments. The style has 5 short lobes. The distinctive fruit is long, beak-like and splits into 5 fruitlets which, when mature, separate and twist so that each seed is attached to a spirally-twisted corkscrew-like awn. All are native to Europe or the Mediterranean region, but are now common weeds of pasture, wasteland and roadsides. Flowers in winter and spring.

Long Storksbill (*Erodium botrys*)

The shiny leaves are deeply dissected but not divided into separate leaflets. The flowers are blue to purple and the fruits 9-12 cm long including the awn.

Common Storksbill (*Erodium cicutarium*)

The leaves are divided into separate leaflets, each leaflet further deeply dissected to almost the midvein. The flowers are pink or white and the fruits 3.5-5 cm long including the awn.



Musky Storksbill (*Erodium moschatum*)

The leaves are divided into separate leaflets, but each leaflet only deeply toothed, usually less than halfway to the midvein. The flowers are pink to mauve and the fruits 3-5 cm long including the awn. Native species of Geraniaceae have broader leaves which are palmately divided (like a hand).

Control

Prevent seed set for 2-3 years. Manual removal and cultivation are effective. Hormone herbicides provide good control of young plants. Spray.Seed® at 2 L/ha provides good non-selective control. Low rates applied at flowering reduce seed set. 2,4-DB(400g/L) at 4 L/ha (80 mL in 10L water) or Lontrel®750 at 120 g/ha (2 g in 10 L water for sot sprays) applied before flowering provides reasonably selective control in bushland. For highly selective control, use Verdict®520 at 100 mL/ha plus oil or 2 mL plus 100 mL oil in 10 L water on actively growing seedlings. Planting tall growing species and reducing grazing will help prevent reinfestation. It is relatively tolerant to glyphosate.



76 *Euphorbia paralias* EUPHORBIACEAE

Description

A leafy perennial to 0.6 m high, whose stems exude an irritant sticky milky sap when damaged. The crowded stalkless leaves are somewhat fleshy and bluish green in colour but may be yellow or red when the plant is under stress. The elliptic stem leaves are 5-18 mm long and 2-7 mm wide, but the egg-shaped floral leaves are much broader up to 18 mm wide. The inflorescence is of yellowish-green petal-less flowers in clusters of heads.

Each head is a cup-shaped structure with crescent-shaped glands and contains 1 female flower and several male flowers. The male flower has 1 stamen and the female flowers a single 3-lobed ovary with 3 styles which are forked. The fruit is a small capsule 5 mm across, which splits to release 3 smooth seeds.

Native to western and southern Europe, now a common weed of coastal dunes and beaches. Flowers spring through to early winter.

Several *Euphorbia* species are weeds. Sun Spurge (*Euphorbia helioscopia*), which is occasionally naturalised in coastal peppermint woodland, differs in having a hairy stem and broader spoon-shaped leaves. Petty Spurge (*Euphorbia peplus*), which is occasionally naturalised in disturbed shrubland, heath and woodland, differs in its stalked leaves and deeply pitted seeds. Garden Weed/Short-stemmed Carnation Weed (*Euphorbia segetalis*) is a weed of coastal heath at Esperance and has narrower leaves and pitted seeds. False Caper or



Geraldton Carnation Weed (*Euphorbia terracina*) a serious weed of agricultural land, road verges, coastal heath and woodland differs in its narrow stem leaves which are minutely toothed towards their tips.

Control

Seedlings can be hand pulled but older plants that have been partially buried usually break off and regrow. Wear gloves because sap is corrosive. Mowing is ineffective. Cultivation is usually not appropriate as it tends to grow on erosion prone dunes. Spray until just wet with a mix of 20 mL glyphosate (450 g/L) plus 0.2 g metsulfuron (600 g/kg) plus 25 mL Pulse penetrant in 10 L water any time the plant is actively growing. For overall spraying use 2 L/ha glyphosate (450 g/L) plus 10 g/ha metsulfuron (600 g/kg) plus wetting agent in non selective situations or 40 g/ha triasulfuron (750 g/kg) where contacting companion plants can't be avoided.



78 *Freesia alba x leichtlinii*
IRIDACEAE

Description

Tufted plant with soft light green basal leaves arising annually from a corm. The erect flowering stem is bent to one side just below the lowest flower and has white or cream to yellow flowers which often have yellow to orange markings and usually the outside of the flower is flushed with purple. The flowers are all arranged on one side of the flower stalk. The strongly sweet-scented flowers are tubular and 6-lobed. Each have 3 stamens and a slender 6-branched style. Freesia is a horticultural hybrid, originally from South Africa, but is now a serious bushland weed occurring in a variety of disturbed habitats. Flowers in spring.



Control

These plants are very difficult to control by hand weeding because they produce seed, corms and cormels. Loosen the soil before removal to prevent the corm breaking off.

Grazing and mowing provide control. 2-3 years of spraying with 0.5 g metsulfuron(600g/kg) plus 25 mL Pulse® in 10 L water will usually eradicate it. One fifth of these rates provides reasonable control with much less damage to native species. Alternatively, 50 mL glyphosate (450g/L) plus 25 mL Pulse® in 10 L water applied in winter or spring before the end of flowering provides good control of existing plants but there is often a subsequent emergence. The area will require spraying again next season to control the tiny seedlings and plants emerging from cormels. Painting leaves or wiping with a sponge glove dipped in a mixture of 1 part glyphosate(450g/L) in 2 parts water can be used in sensitive areas. Replant native shrub species if necessary. Avoid roadworks that carry new cormels into the area. Start control at the top of the catchment to stop seed and cormels transported in water reinfesting treated areas. Don't mow or slash after seed or cormel formation as this may increase spread.



80 *Gazania linearis*

ASTERACEAE

Description

Gazania is a perennial daisy with a tuft of basal leaves. The leaves vary from narrowly elliptic and entire to deeply lobed, 5-10 cm long and 3-20 mm wide, dark green on the upper surface and white-hairy on the lower surface. The flower heads vary from yellow to orange or red in colour and are 5-9 cm across. The outer florets have a spreading petal-like blade 3-4 cm long, while the yellow inner florets are tiny and tubular in shape. The fruits are tiny and are topped by narrow scales and hairs. Native to southern Africa and introduced as a garden plant, now a common garden escape found on roadsides and disturbed areas near settlements and refuse areas. Flowers in winter to early summer. *Gazania rigens* is a very similar species that occurs in the eastern states and in Albany. The feature which distinguishes *Gazania* from most other daisies which are similar in overall appearance, is the under surface of its leaves which have white woolly hairs. Capeweed (*Arctotheca calendula*) does have a hairy under surface to its leaves but has central black rather than yellow



tubular florets. *Arctotis* (*Arctotis stoechadifolia*) can be distinguished from *Gazania* by its silvery foliage.

Control

Use a fork for hand weeding to ensure the underground rhizome is removed with the plant. Mowing is not effective unless repeated regularly and close to the ground.

Grazing normally provides control. Cultivation is effective but rhizomes will transplant in wet conditions. Spray plants until just wet with a mix of 50 mL glyphosate (450 g/L) in 10 L water. In bushland areas use 4 g of Lontrel®750 plus 25 mL Pulse® in 10 water to reduce damage to companion plants. For roadside and overall spraying use 200 g/ha of Lontrel®750 plus 0.25% wetting agent. The best time to apply herbicides is in autumn or spring, but good results can usually be achieved any time the plants are actively growing.



82 *Gladiolus undulatus* IRIDACEAE

Description

Tufted herb with erect sword-shaped leaves arising annually from a corm. The flower spike, often to more than 1 m high has white to cream flowers, sometimes green tinged. The funnel shaped flowers are 11.5-14.5 cm long with 6 pointed petal lobes 5-7 cm long which have a distinctive wavy margin. It has 3 stamens with purple anthers and a 3-branched style.

Wavy Gladiolus occurs commonly along roadsides and watercourses in wetter areas west of Albany. It is native to South Africa and flowers in spring and early summer.



Control

These plants are very difficult to control by hand weeding because they produce many small cormels under the main corm. Spray with 100 mL glyphosate(450g/L) in 10 L of water before flowering in late winter to early spring. The area will require spraying again next season to control the tiny seedlings emerging from cormels. 20 g/ha metsulfuron(600g/kg) or 0.2 g plus 25 mL Pulse® in 10 L water also provides good control with little effect on grasses. Grazing and mowing provide control. Replant native shrub species if necessary. Avoid roadworks that carry new cormels into the area. Start control at the top of the catchment to stop cormels transported in water reinfesting treated areas.



84 *Hypochaeris* species

ASTERACEAE

Description

Herbs with a flat basal rosette of entire to shallowly lobed leaves. The leaves may be smooth and hairless or somewhat bristly. The dandelion-like flower heads, up to 3 cm in diameter, are borne on simple or branched and leafless stalks. The small florets all have radiating petal-like blades. The tiny fly-away fruits are topped by a stalked ring of barbed to feathery bristles.

Flatweeds, originally from Europe, are common weeds of pasture, gardens and roadsides but also spread into bushland. They flower much of the year, but most frequently in spring and early summer. The two species found in WA are difficult to distinguish and hybrids are common.

Smooth Catsear (*Hypochaeris glabra*) is usually annual with smaller flower heads.

Flatweed (*Hypochaeris radicata*) is a perennial with larger flower heads.



Control

Use a weed fork to extract the taproot if hand pulling. Use 2-3 L/ha glyphosate(450g/L) on road shoulders to reduce the spread of seed in traffic slipstreams. In bushland situations, 200 g/ha of Lontrel®750 is as an overall spray or 4 g Lontrel®750 in 10 L water as a spot spray fairly selective. Rosettes may be wiped with a mixture of 1 part glyphosate in 2 parts water. Alternatively, half a teaspoon of urea in the centre of the rosette will control annual but not perennial forms of the plant. For small infestations, 50 mL Tordon®75-D in 10 L water will control growing plants and leave a soil residual to control seedlings for 12 months. Apply herbicides regularly to prevent seeding. Plant perennials and tall growing species to reduce re-invasion. Cultivation provides good control but leaves the area susceptible to re-invasion. Mowing and grazing are ineffective.



86 *Ixia* species IRIDACEAE

Description

Tufted herbs with leaves arising annually from a corm. The flower spike is usually up to 50 cm high with a cluster of several white, pink, red or yellow flowers. The flowers have 6 spreading petals with rounded petal lobes which are 1.5 to 2.5 cm long, 3 stamens and a 3-branched style. There are several species of *Ixia* which often hybridise making identification at the species level difficult.

Originally from South Africa, *Ixia* species have become roadside weeds particularly near old settlements and can be found invading woodlands. Flowers occur in spring and early summer.



Control

These plants are very difficult to control by hand weeding because they produce many small cormels under the main corm. Spray with 100 mL glyphosate in 10 L of water before flowering. The area will require spraying again next season to control the tiny seedlings emerging from cormels. Grazing and mowing provide control. Replant native shrub species if necessary. Avoid roadworks that carry new cormels into the area.

Start control at the top of the catchment to stop cormels transported in water reinfesting treated areas.



88 *Lathyrus tingitanus*

FABACEAE

Description

Scrambling annual herb with winged stems to 3 m long, climbing by means of branched tendrils. Stem wings 2-3 mm wide. Leaves are divided into 2 elliptic leaflets (each 2-6.5 cm long) and a terminal branched tendrils. Inflorescence of 1-3 pink to red or purple (rarely white) pea flowers each up to 3 cm long. The fruit is an oblong and flattened pod 6-10 cm long containing 6-8 seeds. Native to south west Europe but now a weed of roadsides and other disturbed areas. Flowers in spring.

Another species Perennial Pea (*Lathyrus latifolius*) is also naturalised and differs from Tangier Pea in its broader stem wings (4-6 mm wide) and more numerous flowers (3-15 per inflorescence). These species are possibly confused with other weeds, the Vetchs (*Vicia* species) which also climb by means of tendrils but which differ in their leaves being divided into 3-10 pairs of leaflets.



Control

Hand weeding is effective but time consuming due to the high densities of plants that are usually present. Mowing, grazing and cultivation are also effective. For spot spraying use 0.2 g metsulfuron (600 g/kg) plus 25 mL Pulse® in 10 L water and spray until just wet any time before flowering.

In bushland 200 g/ha Lontrel®750 plus 0.25% wetting agent applied in winter before flowering or a spot spray of 4 g Lontrel®750 plus 25 mL Pulse® in 10 L water provides reasonable control and is more selective. Annual control is required to exhaust the seed bank.



89 Tangier Pea

Herbs

90 *Limonium* species PLUMBAGINACEAE

Description

Perennial or annual herbs with a basal rosette of leaves and erect winged stems. The papery flowers are arranged in one-sided inflorescences. The small white or yellow flowers are hidden by the large colourful papery calyx and bracts. The small fruits are retained in the papery calyx.

Native to the Mediterranean region and central Asia.

Winged Sea Lavender (*Limonium lobatum*) has blue to deep purple papery flowers and broadly winged stems. Flowers in spring.

Perennial Sea Lavender (*Limonium sinuatum*) has white, yellow, mauve or blue papery flowers and narrowly winged stems. Flowers in spring and early summer.



Control

Further work on control is required.

Small areas can be manually removed.

It is relatively tolerant to glyphosate and hormone herbicides. Grazing and mowing have variable effects depending on the locality.

0.5 g metsulfuron(600g/L) or chlorsulfuron(750g/kg) plus 100 mL spray oil in 10 L water applied in spring provides reasonable control of the annual

L. lobatum and is expected to give good suppression of the perennial *L. sinuatum*.

Plant tall growing species to increase the levels of shade to help reduce re-invasion.



92 *Lotus* species PAPILIONACEAE (FABACEAE)

Description

Sprawling herbs with their leaves divided into 5, often hairy, leaflets. Three of the leaflets are towards the tip of the leaf and the remaining two at the base and often somewhat clasping the stem. There are small stalked clusters of flowers. The flowers are yellow to orange and 4-15 mm long.

The seed pods are narrow and cylindrical.

Native to Europe, Birdsfoot Trefoils have become weeds along roadsides, in damp pastures and particularly along creeklines. Flowers occur in spring and summer.

Slender Birdsfoot Trefoil (*Lotus angustissimus*) has small flowers 4-7 mm long and long seed pods 2-3 cm long.

Hairy Birdsfoot Trefoil (*Lotus suaveolens*) has slightly larger flowers 6-9 mm long and shorter seed pods 0.5-1.5 cm long.

Greater Birdsfoot Trefoil (*Lotus uliginosus*) has larger clusters (up to 15 flowers) of larger flowers each 9-15 mm long and seed pods 1.5-3.5 cm long.



Control

Mowing to 5 cm every 3 weeks provides reasonable control. Don't burn infested areas. Improve drainage to reduce water logging during winter. Herbicides provide the most effective control. Use picloram based products such as 100 mL Tordon®75-D plus 25 mL wetting agent in 10 L water in grass dominant situations or on small infestations. Use 60 g/ha Logran® or 200 g/ha Lontrel®750 for reasonably selective control in native vegetation. For hand spraying mix 25 mL wetting agent plus 1 g Logran® or 4 g Lontrel®750 in 10 L water and apply in winter to early summer when actively growing. 0.1 g metsulfuron(600g/kg) plus 25 mL wetting agent in 10 L water also provides good control but may damage young native species at these rates. Glyphosate is not very effective. Grazing generally provides little control. Cultivation tends to make infestations worse. Replant native trees and shrubs to reduce light levels.



94 *Lupinus* species

PAPILIONACEAE (FABACEAE)

Description

Erect herbs with leaves divided into 5-13 narrow finger-like leaflets all radiating from a central point. The flowers are arranged alternately or in whorls up the tall flower spike, each flower 1-1.5 cm long. The seed pods are 3.5-6 cm long, slightly flattened and sometimes a little constricted between the seeds. Native to the Mediterranean region, Lupins are common weeds of roadsides and waste places, sometimes invading bushland. Flowers in winter and spring.

White Lupin (*Lupinus albus*) has 5-9 leaflets 10-15 mm wide and white flowers.

Narrowleaf Lupin, New Zealand Blue Lupin (*Lupinus angustifolius*) has 5-9 narrow leaflets 1-6 mm wide and blue flowers, mostly single up the flower spike.

Western Australian Blue Lupin (*Lupinus cosentinii*) has 9-13 broader leaflets 5-15 mm wide and blue flowers in whorls up the flower spike.

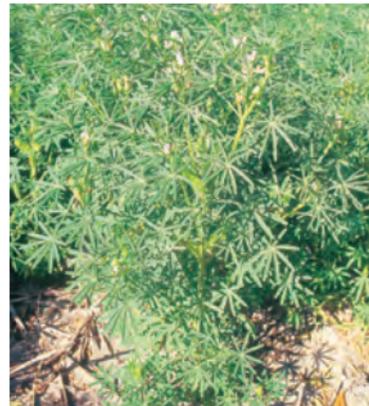
Yellow Lupin (*Lupinus luteus*) has 7-11 leaflets 4-15 mm wide and yellow flowers.



Control

Prevent seed set for 2-3 years by mowing, grazing, cultivating, spraying or hand pulling before flowering.

Small areas can be treated with 20 mL of Tordon®75-D in 10 L of water in early winter. This will kill existing plants and leave a soil residual which controls Lupin and other broadleaved seedlings for about a year. Larger areas can be treated with more selective herbicides such as 200 g/ha Lontrel®750 or 50 g/ha Logran®. The latter 2 treatments are relatively selective in bushland. For hand spraying mix 25 mL wetting agent plus 4 g Lontrel®750 or 1 g Logran® in 10 L of water. Metsulfuron provides good control but is less selective. Glyphosate is relatively ineffective. Grazing by native animals usually keeps Lupins under control in healthy bushland.



96 *Medicago polymorpha*
PAPILIONACEAE (FABACEAE)

Description

Low-growing sprawling herb with leaves divided into 3 heart-shaped leaflets each 4-25 mm long. There are small clusters of yellow pea flowers, the petals only 3-5 mm long. The fruit is a small, tightly coiled burr, often spiny. Native to the Mediterranean region, Burr Medic is a common weed of gardens, pastures and roadsides. Flowers in winter and spring.

Differs from native species which have leaves divided into 3 leaflets such as *Gompholobium* and *Kennedia* and in its flower and fruit characters.

Gompholobium marginatum has similar leaves but a loose cluster of few larger flowers and a stalked, somewhat brittle, broad pod.

Kennedia species usually have much larger leaflets and have much larger pink to red or orange flowers and a cylindrical pod.



Control

Exclude stock to reduce dispersal of burrs. Hand pull odd plants in winter before flowering. For small infestations and grass dominant areas an annual application of 10 mL Tordon®75-D in 10 L water in early winter gives excellent control of existing plants and has residual activity to control later seedlings. In bushland, 25 mL of wetting agent plus 4 g of Lontrel®750 or 1 g of Logran® in 10 L water applied in early winter provides reasonably selective control. Repeat annually for several years. Plant tall growing perennial species to reduce re-invasion. It is relatively tolerant to glyphosate, grazing and mowing. Metsulfuron also provides good control.



98 *Moraea flaccida*
IRIDACEAE

Description

Herb with a single sprawling basal leaf to 70 cm long produced annually from a small corm. The branched flowering stem has short-lived pink to orange flowers. The flowers each have 6 petals, 3-4 cm long, 3 stamens and a 3-branched style in which each branch has 2 short lobes or 2 short crests. It reproduces by seeds as well as corms.

Prior to flowering, Cape Tulip can be recognised by the browning-off of the leaf tips.

Cape Tulips were previously assigned to the genus *Homeria*.

A weed of pasture, roadsides and disturbed bushland.

Native to South Africa. Flowers in late winter and spring.

It is toxic to stock. Most deaths occur in animals that have recently been introduced to the plant.



Control

Control by manual removal is difficult due to many dormant corms in the soil. Dig plants with surrounding soil and incinerate or drench with diesel. Cultivation to 150 mm provides control if done after the old corm shrivels and is exhausted and before the new corms form. This is often in June or July but may be September. Dig up plants to determine their stage. Clear trash by burning or cultivation in late summer. Hand spray until just wet in June to early September each year with one of the following mixtures: 0.2 g of chlorsulfuron(750g/kg) or metsulfuron(600g/kg) or 100 mL glyphosate(450g/L) in 10 L water plus 25 mL Pulse®. Use 50 mL amitrole(250g/L) plus 50 mL simazine(500g/L) plus 50 mL 2,4-D amine(500g/L) plus 25 mL Pulse® in 10 L water for areas such as firebreaks. In sensitive areas in spring, use a blanket wiper or sponge glove using 1 L of glyphosate or 2 g of chlorsulfuron or metsulfuron in 2 L of water. 1-2 L/ha of paraquat in spring is also effective. Control normally takes several years and follow up is essential for good control. Cultivation to expose the corms a few weeks after spraying may improve control.



99 One-leaved Cape Tulip

Herbs

100 *Moraea miniata*

IRIDACEAE

Description

Herb with 2 or 3 sprawling leaves produced annually from a small corm. The branched flowering stem has short-lived pink to orange flowers. The flowers each have 6 petals to 2.5 cm long, 3 stamens and a 3-branched style in which each branch has 2 short lobes or 2 short crests. It reproduces by corms, cormels and bulbils which may be found in the leaf axils and the withering flowers. Prior to flowering Cape Tulip can be recognised by the browning-off of the leaf tips.

Cape Tulips were previously assigned to the genus *Homeria*.

Flowers in late winter and spring.

It is toxic to stock. Most deaths occur in animals that have recently been introduced to the plant.



Control

Control by manual removal is difficult due to many cormels formed around the basal corm and bulbils in the leaf axils and flowers. Dig plants with surrounding soil and incinerate or drench with diesel. Cultivation to 150 mm provides control if done after the old corm shrivels and is exhausted and before the new corms form. This is in June or July but may be September. Dig up plants to determine their stage. Clear trash by burning or cultivation in late summer. Hand spray until just wet in June to early September each year with one of the following mixtures: 0.2 g of chlorsulfuron(750g/kg) or metsulfuron(600g/kg) or 100 mL glyphosate(450g/L) in 10 L water plus 25 mL Pulse®. Use 50 mL amitrole(250g/L) plus 50 mL simazine(500g/L) plus 50 mL 2,4-D amine(500g/L) plus 25 mL Pulse® in 10 L water for areas such as firebreaks. In sensitive areas in spring, use a blanket wiper or sponge glove using 1 L of glyphosate or 2 g of chlorsulfuron or metsulfuron in 2 L of water. Control normally takes several years and follow up is essential for good control. Cultivation to expose the corms a few weeks after spraying may improve control.



101 Two-leaved Cape Tulip

Herbs

102 *Oenothera* species

ONAGRACEAE

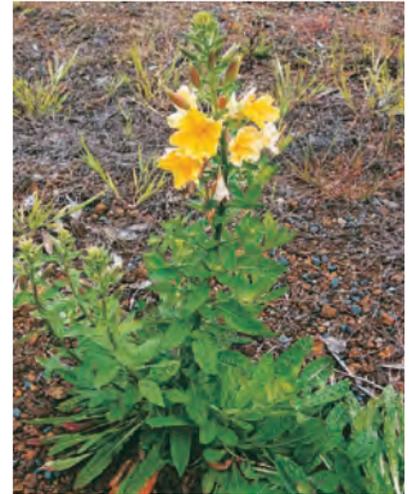
Description

Erect herbs with a basal rosette of large leaves and a tall leafy spike of flowers. The flowers are yellow, opening in the evening, becoming tinged with red and withering the following day. The flowers are up to 10 cm across with a slender tube, 4 large spreading petals and 8 stamens. The fruit is long and slender.



Tall Evening Primrose (*Oenothera glazioviana*)
 Herb to 1.5 m high, the stems with tiny red spots (the bases of hairs). Flowers up to 10 cm across. Common along roadsides. Probably native to Europe. Flowers in early summer to autumn.

Common Evening Primrose (*Oenothera stricta*)
 Herb to 1 m high, with narrower leaves and stems lacking prominent red spots. Flowers smaller, up to 8 cm across. Also common along roadsides. Native to South America. Flowers much of the year but predominantly in spring.



Control

It is difficult to remove by hand because it tends to break off and regrow from the rootstock. If removing manually, use a fork and ensure that all the fleshy rootstock is collected and burnt or buried more than 1 m deep.

It is relatively tolerant of glyphosate.

Spray young actively growing plants and a 5 m buffer area in spring or autumn with 50 g/ha Logran® plus 1% spray oil. Use 1g Logran® plus 100 mL spray oil in 10 L water for hand spraying. Alternatively 4 L/ha 2,4-DB(400g/L) may be used. Both herbicides are relatively selective in bushland situations and 2,4-DB is preferred in areas where there are many seedlings of native species. Respray regrowth as it appears.

2,4-D amine at 1-3 L/ha is used in S.A. pastures.



104 *Ornithogalum thyrsoides*
HYACINTHACEAE

Description

Erect herb with broad somewhat succulent basal leaves arising from a bulb. The flowering stem, about 30 cm high, is held above the leaves with a dense, pyramid-shaped cluster of many white flowers. There are 6 petals each 2-2.5 cm long and usually with a basal greenish brown blotch, 6 yellow stamens and a short undivided style.

Native to South Africa, Chinchinchee has become a problem weed near Tambellup. Flowers in spring and summer. It is toxic to stock, especially in autumn.



Control

This plant is very difficult to control. It can be dug out providing the bulbs are removed and burnt. Glyphosate is ineffective. 1 g of metsulfuron(600g/kg) plus 25 mL Pulse® in 10 litres water provides partial control. 10 mL Arsenal® plus 25 mL Pulse® in 10 litres of water is best. Spray the plants before flowering and spray a 1 m buffer area around each plant to control seeds. This treatment will kill a wide range of companion plants for about one year after spraying.



Chinchinchee

106 *Ornithopus* species
PAPILIONACEAE (FABACEAE)

Description

Sprawling annual herbs with leaves divided into numerous narrow leaflets. Serradella has stalked head-like clusters of pea flowers. The flowers are yellow, or sometimes white to pink and 6-8 mm long. The seed pods are linear, straight or curved and separate at maturity into single-seeded units. All are native to Europe or the Mediterranean region but have become weeds along roadsides, particularly in wetlands. All flower in spring.

Yellow Serradella (*Ornithopus compressus*) is a greyish hairy plant with yellow flowers and a narrow but compressed seed pod. Widespread.

Slender Serradella (*Ornithopus pinnatus*) is almost hairless with yellow flowers and a narrowly cylindrical seed pod. Widespread.

French Serradella (*Ornithopus sativus*) is a hairy plant with white to pink flowers and a narrow but very compressed pod which is distinctly constricted between the seeds. Occurs around Esperance and will become more widespread with agricultural plantings.



Control

Exclude stock to reduce dispersal of seed.
Hand pull odd plants in winter before flowering. For small infestations and grass dominant areas an annual application of 10 mL Tordon®75-D in 10 L water in early winter gives excellent control of existing plants and has residual activity to control later seedlings. 200 mL/ha Lontrel®750 or 50 g/ha Logran® applied in early winter provides reasonably selective control in bushland areas. For hand spraying use 25 mL wetting agent plus 4 g Lontrel®750 or 1g Logran® in 10 L water. Repeat annually for several years. Plant tall growing perennial species to reduce re-invasion. It is relatively tolerant to glyphosate, grazing and mowing.
Metsulfuron(600g/kg) also provides good control at 5 g/ha.



108 *Oxalis* species

OXALIDACEAE

Description

Herbs often with tubers or bulbs. Leaves are produced annually, each divided into 3 heart-shaped leaflets. The flowers are either single or in clusters, each with 5 brightly coloured petals fused into a tube towards the base. There are 10 stamens and 5 styles. The fruit is a narrow capsule. The species common to the South Coast region are natives of South Africa, now weeds in gardens, crops and pasture, also along roadsides. Flowers much of the year but mainly in winter and spring.

Soursob (*Oxalis pes-caprae*)

Herb which grows from tubers and bulbs, with clusters of yellow flowers radiating from a tall stalk held above the tuft of long-stalked leaves. The leaflets sometimes have dark markings.



Yellow Wood Sorrel (*Oxalis corniculata*)

Creeping herb, much-branched with stems which root at many points and single flowers or small clusters of yellow flowers occurring among the leaves. The stems are sometimes reddish. The flowers are much smaller than those of Soursob.



Four O'clock (*Oxalis purpurea*)

Rosettes of leaves arising from a bulb, the leaflets may be tinged purple on the underside. The flowers occur singly and are usually pink to purple with a yellow throat but sometimes white with a yellow throat.



109 Soursob, Wood Sorrel, 4 O'clock
Pale-flowered & Finger-leaf Oxalis

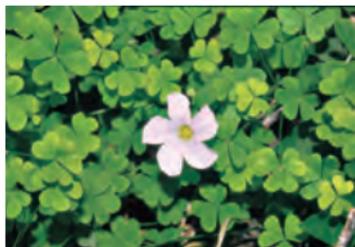
Herbs

110 *Oxalis* species

OXALIDACEAE

Pale-flowered Oxalis (*Oxalis incarnata*)

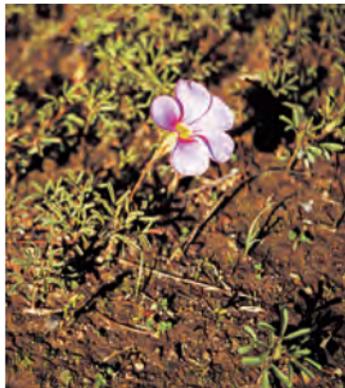
Delicate sprawling herb with clusters of green leaves at the ends of the stems and single white to pale pink flowers held above the leaves. Often a weed of woodland or Karri forest.



Finger-leaf Oxalis (*Oxalis glabra*)

Herb with an erect thin leafy stem and single large flowers held above the leaves. The leaflets are small and narrower than those of the other species. The flowers are pink to purple (occasionally white) with a yellow throat.

A weed of heavier soils in disturbed woodland and occurs from Perth to York, south to Augusta and around Kojonup.



Control

Mowing and grazing are generally ineffective and manual removal very difficult. Sulfonyl urea herbicides and diuron usually provide the best control. 0.1 g metsulfuron(600g/kg) or 0.2 g chlorsulfuron(750g/kg) plus 25 mL wetting agent in 10 L water applied when the plants are actively growing provides good control. Repeat if regrowth appears. For spot spraying use 100 mL glyphosate(450g/L) in 10 L of water when the plants are young and actively growing. 50 mL diuron(500g/L) in 10 L of water will kill plants and leaves a soil residual to help control corms or seeds germinating after spraying. Diuron can damage many species of trees and native plants and should not be applied in the root zone of desirable plants or where water flows may take it to desirable plants.

300 mL/ha Spinnaker® controls *O. purpurea* in pasture and 50 g/ha Logran® controls *O. glabra*. These will probably kill other *Oxalis* species also.



111 Soursob, Wood Sorrel, 4 O'clock
Pale-flowered & Finger-leaf Oxalis

Herbs

112 *Polygonum aviculare* POLYGONACEAE

Description

Wireweed is a ground-hugging or sprawling herb with oval leaves usually 5-12 mm long. At the base of each leaf is a white to silvery sheath around the stem. In the leaf axils are small clusters of pink-tinged flowers 2-3 mm long. Each flower is 5-lobed and has 7 or 8 stamens and 3 styles. The fruits are small and 3-angled, enclosed in the withered flower.

Native to Europe, Wireweed is a common weed of pastures, roadsides and waste land. Flowers occur in autumn and spring.

Control

Cultivate before flowering. Manual removal is usually difficult because plants tend to grow in heavy soil and break off at the base and re grow. Use a weed fork to extract the taproot if removing manually. In bushland areas, wipe actively growing plants with a mixture of 1 L glyphosate(450g/L) plus 2 L water. For small areas, apply a mixture of 0.2



g metsulfuron(600g/kg) plus 100 mL Tordon®75-D to actively growing plants before flowering in spring or summer depending on when the Wireweed has germinated. On larger areas, Spinnaker® at 1 L/ha, or 10 mL per 10 L water for hand spraying, will provide reasonably selective control of small actively growing Wireweed and control seedlings for about a year. 5-10 g/ha of metsulfuron(600g/kg) or 0.2 g plus 25 mL wetting agent in 10 L water also provides good control. Inspect 3 times a year for several years. For broadacre spraying, 1 L/ha glyphosate plus 500 mL/ha 2,4-D ester plus 500 g/ha simazine(900 g/kg) plus 1% spray oil is used to control seedlings in spring and reduce summer establishments.



113 Wireweed

Herbs

114 *Rumex* species

POLYGONACEAE

Description

Erect herbs with leaves in a basal rosette and also up the stem. The small flowers are arranged in whorls up the flower spike, greenish in colour but turning reddish when in fruit. Each flower has small floral segments, 6 stamens and 3 styles. The fruit is enclosed between 3 valves (the enlarged inner floral segments).

Curled Dock (*Rumex crispus*)

A tall plant up to 1.5 m with pointed oval leaves 4-24 cm long. The leafless inflorescence has densely clustered flowers and fruits. The fruit valves are reddish brown, swollen in the centre, with the margins smooth and lacking teeth.

Native to Europe and south-west Asia, a weed of creeklines, pasture and disturbed woodland. Flowers in winter, spring and early summer.



Fiddle Dock (*Rumex pulcher*)

Plant to 0.5 m with rounded oblong leaves, the basal ones sometimes slightly constricted in the middle and appearing “fiddle-shaped”. The leaves are 4-15 cm long. The leafy inflorescence has distant whorls of flowers and fruits. The fruit valves are brown, swollen and warty in the centre, the margin with prominent stiff teeth. Native to the Mediterranean region and south-west Asia, a common weed of creeklines, pastures and waste land. Flowers in spring and early summer.

Control

Remove isolated plants by cutting their roots at least 20 cm below ground level. Individual plants may be wiped with a mixture of 1 L glyphosate(450g/L) in 2 L water. On small infestations 0.5 g chloresulfuron(600g/kg) plus 100 mL Tordon®75-D in 10 L of water in winter will control existing plants and seedlings for about a year. Some seed remains viable for 20 years. 2 L/ha glyphosate can be used selectively in some seasons when dock is green and annuals are not. Metsulfuron is also effective. Grazing and mowing usually lead to greater stands. Plant tall growing perennial species to increase the levels of shade and help reduce re-invasion.



116 *Senecio elegans* & *glastifolius*

ASTERACEAE

Description

Senecio elegans or Purple Groundsel is a herb with toothed to deeply dissected leaves. The clustered flower heads are a bright deep pink to purple with a yellow centre. The outer florets have radiating petal-like blades while the inner florets are tubular. The tiny fruits are topped by many bristles.

Originating from South Africa, Purple Groundsel is now a weed in sand dunes along the south coast. Flowers spring and early summer.

Another species, *Senecio glastifolius* or Holly-leaved Senecio, also has pink to purple flower heads but is more shrubby, up to 2 m high and with toothed oblong leaves. Again originating from South Africa it is a weed of woodland areas near Albany.

All our native *Senecio* species have yellow flowers apart from *Senecio leucoglossus* which has white or pale purple flowers.



Control

Hand pulling the plants for a few years in spring before flowering should provide control. Flowering plants need to be bagged and burnt as seed will mature on reserves within the stems.

Lontrel®750 at 200 g/ha applied before stem elongation in late spring provides reasonably selective control in coastal heath and bushland. For hand spraying use 4 g Lontrel®750 in 10 L water.

Small infestations can be treated with 100 mL Tordon®75-D in 10 L water which will provide control of the plants and leave a soil residue for control of later emerging seedlings. Cultivation and grazing provides reasonable control. New infestations in bushland tend to establish after disturbance or fire.



117 Purple Groundsel and
Holly-leaved Senecio

Herbs

118 *Silybum marianum*

ASTERACEAE

Description

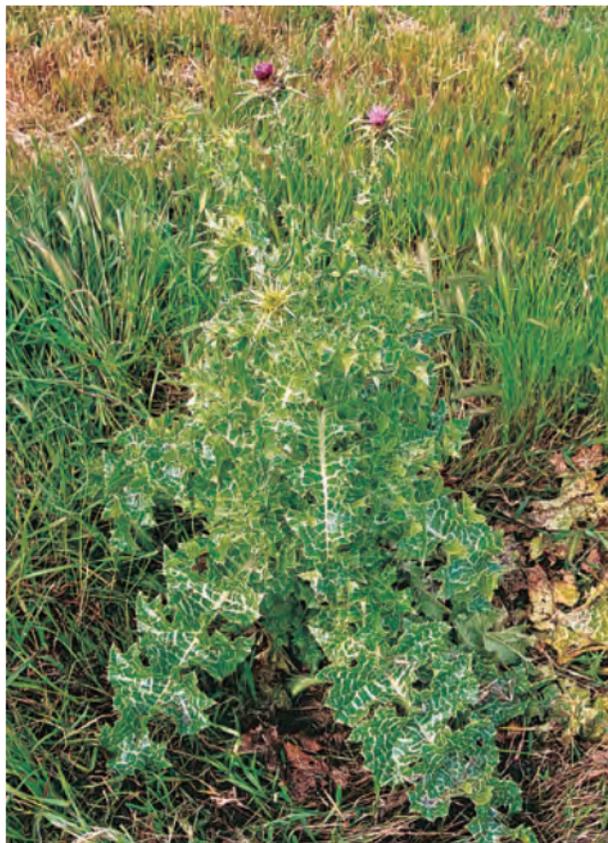
The stems of Variegated Thistle are neither spiny nor winged. The stem-clasping leaves are variegated with white veins and patches on the upper surface and are shallowly to deeply lobed with prickly margins. On each stem there is a single purple flower head which is extremely spiny and very large (up to 9 cm in diameter including the long spines). The fruits are topped by simple to minutely barbed bristles. Native to Europe, south-west Asia and northern Africa, it is an occasional weed of pasture, plantations and roadsides. Flowers in spring and early summer.

Control

Prevent seed set for several years. Mowing is not very effective because the plant regrows. Manual removal is very difficult because of the extensive root system and prickly nature. Blanket wipers applying 3 L/ha glyphosate (450g/L) or 2 L/h paraquat(250g/L) at flowering can provide partially selective control. Overall spraying with 200 g/ha Lontrel®750 or 4 g in 10 L water provides reasonably selective control in bushland. Spray-grazing



with 20 g/ha Lontrel®750 plus 500 mL/ha MCPA(500g/L) provides partial control in Clover pasture. Replant perennial species to increase shading. For isolated plants, spray with a mixture of 100 mL Gazon® plus 4 g Lontrel®750 in 10 L water. Remove and burn any flowering stems. Spraying a five metre buffer around each plant will help control late seedlings. This will damage most young broad-leaved species. Cultivation provides variable control. Grazing with sheep to reduce pasture then grazing with goats at flowering provides good control in 3 years.



119 Variegated Thistle

Herbs

120 *Solanum hoplopetalum*
SOLANACEAE

Description

Afghan Thistle is a very prickly sprawling perennial herb to 0.3 m high, with many spines to 15 mm long on the stems, leaves and the calyx. The leaves are 3-15 cm long and deeply lobed, with simple and gland-tipped hairs as well as the spines. The flowers are pale blue or white and 1.5-3 cm across. The berry is globular, 1.5-2 cm across, at first green but turning black at maturity and mostly hidden by the enlarged prickly calyx.

A native species occurring in the wheatbelt and goldfields but has become a weed of crops, pastures, waste land and alongside roads and railway lines.

Flowers in spring and summer.

A similar very prickly species, *Solanum hystrix*, which is native to South Australia, has become naturalised at Perenjori and Norseman. *Solanum hystrix* differs in its few or no hairs.



See the key for the weedy *Solanum* species on page 208.

Control

Repeated cultivations (preferably with a disc plough) starting in October to November when the plant is starting to grow and repeated as necessary to prevent flowering and exhaust the rootstock provides eventual control.

Patches should be treated individually to prevent contamination of clean areas.

Manual removal is difficult because it is very spiny and the root system needs to be removed and burnt.

Grazing and mowing are not effective.

Spot spray small areas with a mixture of 100 mL Grazon® in 10 L water or 20 g Lontrel®750 in 10 L water when the weed is actively growing in summer. Lontrel provides more selective control than Grazon. Several annual applications are usually required.

A combination of sprayig followed by cultivation a few weeks later often proivdes higher levels of control than either technique alone.

Plant perennial species or encourage shrub species and litter build up to reduce re-infestation.

In bushland situations, control is not generally warranted as it may be native to the area.



122 *Solanum nigrum*

SOLANACEAE

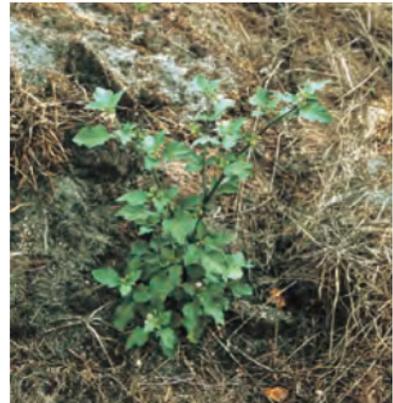
Description

Herb or small short-lived shrub to 1 m high. The leaves are 2-7.5 cm long, entire or very shallowly lobed. The flowers are white, in short-stalked clusters of 4-12 flowers, each flower about 1 cm across with 5 spreading petals. The succulent, globular berries are usually 6-8 mm across, at first green but becoming dull black at maturity and each containing 25-35 seeds about 2 mm long.

Probably native to Europe, now a common weed of horticulture, gardens, pasture and waste land it is readily spread by birds into bushland. Flowers much of the year.

Glossy Nightshade (*Solanum americanum*) differs in its glossy berries and its more numerous smaller seeds (40-50 seeds per berry, each 1-1.5 mm long). Three-flowered Nightshade (*Solanum triflorum*) differs in its more deeply lobed leaves which have 7-9 toothed lobes, its flowers which are in clusters of only 3 and also in its larger marbled whitish green berries 8-12 mm across.

See the key for the weedy *Solanum* species on page 208.



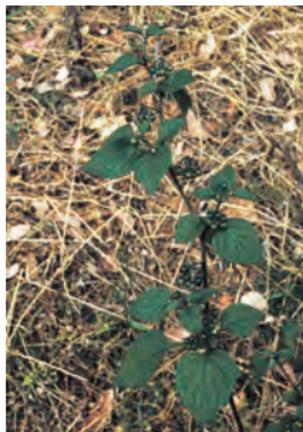
Control

Prevent seed set for several years.

In bushland situations, manually remove plants before flowering. On larger infestations, 1 L/ha Starane® or 20 mL in 10 L water, applied when the weed is actively growing in summer, will provide reasonably selective control. Plant perennial species that provide a good mulch over the summer period to reduce re-invasion. Control infestations within 5 km of the target area to reduce dispersal of seed by birds.

1 L/ha 2,4-D amine(500g/L) or 20 mL in 10 L water is also used for the control of young plants in early summer and at these rates causes little damage to most established native species.

Encourage shrub species and litter build up to reduce re-infestation. Blackberry Nightshade usually only germinates where the soil has been bared.



123 Blackberry Nightshade

Herbs

124 *Sonchus* species

ASTERACEAE

Description

Herbs with hollow stems which have a milky sap. The stem-clasping leaves are up to 30 cm long and toothed, the teeth sometimes prickly. The yellow dandelion-like flower heads are clustered, each about 2 cm in diameter, with all the florets having a radiating petal-like blade. The tiny fruits are short and flattened, topped by a tuft of fine soft bristles. Native to Europe, Asia and northern Africa, they are common weeds of pasture and waste land, but also invading bushland particularly in damp areas. Sowthistles flower much of the year but mainly in spring and early summer.

Prickly Sowthistle (*Sonchus asper*) has coarser, more leathery prickly leaves.

Common Sowthistle (*Sonchus oleraceus*) is less robust, with softer leaves which are not prickly-toothed.

The two species are often difficult to tell apart and occasional hybrids have been found. The native, *Sonchus hydrophilus*, is similar but has longer narrower leaves which are wavy or shallowly lobed rather than prickly toothed.



Control

Manually remove isolated plants or graze the area to prevent seed set for several years. Single plants may be sprayed with 50 mL glyphosate(450g/L) in 10 L water or wiped with a mixture 1 L glyphosate(450g/L) in 2 L water at any time before budding. Spray small areas with a mixture of 100 mL of Tordon®75-D plus 25 mL wetting agent in 10 L of water in June each year. This will kill growing plants and leave a soil residual to control seedlings. In bushland situations 4 L/ha 2,4-DB(400g/L) or 80 mL 2,4-DB(400g/L) plus 25 mL wetting agent in 10 L of water for hand spraying will provide reasonably selective control when applied in June. A repeat application may be necessary in late spring in areas where a spring germination occurs.



125 Sowthistle

Herbs

126 *Sparaxis* species

IRIDACEAE

Description

Small tufted herbs arising annually from a corm. Flower spikes to 50 cm high with several 6-petalled flowers. *Sparaxis bulbifera* has white to cream flowers with a yellow centre and *Sparaxis pillansii* has purple-pink flowers with a dark maroon to purple band and a yellow centre. *Sparaxis bulbifera* has 3 white anthers and *Sparaxis pillansii* has 3 yellow to brown anthers. Each flower has a 3-branched style. Cormels are produced after flowering. Harlequin Flowers are native to South Africa and were introduced as garden plants which hybridise easily. They are now weeds of roadsides particularly near old settlements.



Control

These plants are very difficult to control by hand weeding because they produce seed, cormels and corms. Loosen the soil before removal to prevent the corm breaking off. Hand weed before flowering and cormel formation. Spray with 100 mL glyphosate(450g/L) plus 25 mL Pulse® in 10 L of water before the end of flowering or 0.1 g metsulfuron(600g/kg) plus 25 mL wetting agent in 10 L water. Repeat annually. Good control can usually be achieved in 2-3 years. Wiping with a sponge glove using 1 part glyphosate(450g/L) in 2 parts water can be used in sensitive areas. Replant native shrub species if necessary. Avoid roadworks that carry new cormels into the area. Start control at the top of the catchment to reduce re-infestation.



127 Harlequin Flower

Herbs

128 *Trachyandra divaricata*
ASPHODELACEAE

Description

Tufted herb with somewhat succulent, flattened, strap-like leaves 35–45 cm long. The flowering stem is widely branched and often somewhat sprawling. The white flowers are similar to those of Onion Weed, the petals are a similar size but have two yellowish spots near their base. There are 6 stamens with yellowish anthers and a slender unbranched style.

Native to South Africa, Dune Onion Weed is often found as a weed in dunes and coastal heath along the south west coast, mainly from Albany westwards. Flowers in late winter and spring. It is toxic to horses.



Control

Manually remove isolated patches before flowering. Cultivate in summer to kill old plants and repeat in the following summer to control seedlings that have established. Cultivation when the soil is wet is usually ineffective.

Wick or blanket applicators or sponge gloves, using 5 g of metsulfuron or 500 mL of glyphosate plus 2.5 mL wetting agent per litre of water are useful in sensitive areas. Apply before flowering. Larger areas can be sprayed with 20 g/ha chlorsulfuron(750g/kg) or 0.4 g plus 25 mL wetting agent in 10 L water in winter or spring when the plants are actively growing. This will kill most annual legumes and the seedlings of some native plants.

Replant shrub and tree species.



130 *Trifolium* species

PAPILIONACEAE (FABACEAE)

Description

Herbs with leaves divided into 3 leaflets and head-like clusters of very small pea flowers. The small, fairly soft seed pod remains hidden amongst the withered floral parts and contains only 1 or 2 seeds.

A large number of species of Clover, mostly introduced as pasture plants, are now common weeds of roadsides, gardens and waste places, sometimes invading bushland.

Narrowleaf Clover (*Trifolium angustifolium*)

An erect plant with long narrow leaflets 15-75 mm long and cylindric heads of pink flowers. Native to the Mediterranean region. Flowers in late winter, spring and early summer.

Hare's Foot Clover (*Trifolium arvense*)

Erect or sprawling plant with narrow leaflets 5-20 mm long and ovoid to shortly cylindric heads of white or pink flowers. Native to Europe, Asia and northern Africa. Flowers late winter, spring and summer.



Hop Clover (*Trifolium campestre*)

Sprawling plant with fairly broad leaflets 4-15 mm long and globular to ovoid heads of yellow flowers. Native to Europe and western Asia. Flowers late winter, spring and early summer.

Suckling Clover (*Trifolium dubium*)

Sprawling or ground-hugging plant with fairly broad leaflets 4-12 mm long and loose globular heads of yellow flowers. The heads have fewer flowers than those of Hop Clover. Native to Europe. Flowers late winter, spring and summer.



Cluster Clover, Ball Clover
(*Trifolium glomeratum*)

Ground-hugging plant with broad leaflets 5-22 mm long and globular heads of pink flowers. Native to western and southern Europe. Flowers in winter and spring.



Peter Maloney, Dept of Agric. WA,
Western Weeds

132 *Trifolium* species

PAPILIONACEAE (FABACEAE)

Rose Clover (*Trifolium hirtum*)

Hairy plant with fairly broad leaflets 10-25 mm long and globular to semi-globular heads of pink to purple flowers. Native to the Mediterranean region. Flowers in spring

White Clover (*Trifolium repens*)

A ground-hugging plant with broad leaflets 4-12 mm long which often have a pale v-shaped band and globular heads of white flowers. Native to Europe. Flowers in winter, spring and summer.

Subterranean Clover (*Trifolium subterraneum*)

Ground-hugging plant with broad leaflets 6-22 mm long and few-flowered heads of white flowers that form globular buried burrs. Native to Europe and the Mediterranean region. Flowers in late winter and spring.



Woolly Clover (*Trifolium tomentosum*)

A sprawling plant with broad leaflets 4-13 mm long and globular heads of pink flowers which become woolly with age. Native to the Mediterranean region. Flowers in spring.

Control

Prevent seed set for 5 years.

Exclude stock to prevent dispersal of seed and burrs.

Hand pull odd plants in winter before flowering. For

small infestations and grass dominant areas an annual application of 10 mL Tordon®75-D in 10 L water in early winter gives excellent control of existing plants and has residual activity to control seedlings. In bushland, 200 g/ha Lontrel®750 or 50 g/ha Logran® applied in early winter provides reasonably selective control. Use 25 mL wetting

agent plus 4 g Lontrel®750 or 1 g Logran® or 0.1 g metsulfuron(600g/L) or 0.1 g chlorsulfuron(750g/kg) in 10 L water for hand spraying when they are actively growing. Repeat annually for several years. Plant tall growing perennial species to reduce re invasion. Clovers are relatively tolerant to glyphosate, grazing and mowing.



134 *Tropaeolum majus*
TROPAEOLACEAE

Description

Soft, sprawling or scrambling herb with somewhat fleshy stems. The leaves are circular and 3-8 cm across but their stalk is attached to the centre of the leaf like a tiny umbrella. The large trumpet-shaped flowers vary in colour from yellow through orange to red and have a prominent straight or curved basal spur. There are 8 stamens and a slender 3-lobed style. The fruit splits into 3 segments.

Native to South America, Nasturtium is a garden escape of hybrid origin, now a weed of roadsides, waste land and disturbed creeklines. Flowers in spring.



Control

Manually remove, ensuring the larger roots are also collected, and burn. There is often a large germination of seedlings following removal of the parent plants. These can be controlled by light cultivation or by the herbicides below. 2,4-DB at 4 L/ha plus 0.25% wetting agent or 80 mL 2,4-DB(400g/L) plus 25 mL wetting agent in 10 L water will provide reasonably selective control in bushland situations. In areas where hormone herbicides can't be used, apply 20 mL glyphosate(450g/L) plus 25 mL wetting agent in 10 L water. Apply any time the plants are actively growing. Seedlings can be controlled with half of these rates. Repeat as necessary.



136 *Urtica urens*
URTICACEAE

Description

Dwarf Nettle is an annual herb to 0.8 m high with harsh stinging hairs. The leaves are opposite, with an egg-shaped blade 2-7 cm long and 1.5-5 cm wide, and clearly toothed. The separate male and female flowers are greenish and loosely clustered in the leaf axils. Each flower has 4 sepals (unequal in size in female flowers) but no petals, the male flowers have 4 stamens. The fruit is a tiny nut. Native to Europe, now a weed of waste and cultivated land particularly in shady places. The hairs can produce redness of the skin and an intense itchiness. Flowers winter and spring. Possibly confused with the native Scrub Nettle (*Urtica incisa*). Scrub Nettle is a perennial herb with larger darker green leaf blades 5-12 cm long which are more broadly toothed and it also has more conspicuous flower sprays. Fat Hen (*Chenopodium album*) differs in its alternate leaves and absence of stinging hairs.



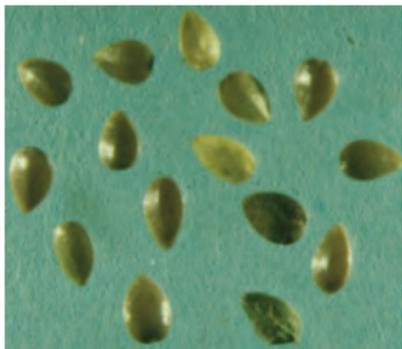
Control

Prevent seed set for several years.

Manual removal is difficult because the leaves and stems have stinging spines. Isolated plants can be dug up with a fork or cultivator. Mowing is only effective if repeated regularly and low enough to remove all flowers from July to December. Grazing is not very effective. For spot spraying use a mixture of 100 mL glyphosate (450 g/L) in 10 L water. Add 1 mL Hammer for higher levels of control. Apply in autumn or winter before flowering. A repeat application may be required to control plants that germinate after spraying.

4 L/ha of 2,4-DB with wetting agent can be used in bushland for more selective control.

Apply annually in June and repeat in September.



137 Stinging Nettle

Herbs

138 *Vicia species*

PAPILIONACEAE (FABACEAE)

Description

Vetch (*Vicia sativa*) is a scrambling herb climbing by means of branched tendrils. The leaves are divided like a feather into 3-10 pairs of small narrow leaflets, each 8-30 mm long. There are pink to purple pea flowers, each 1-2 cm long and either single or in few-flowered clusters.

The seed pod is narrow, slightly flattened and 3-5 cm long.

Native to western Asia, now a weed of roadsides, waste land, sometimes invading bushland. Flowers in spring.

A further species, **Hairy Vetch** (*Vicia hirsuta*) may also be found and differs in its elongated inflorescence of several, but much smaller, flowers each only 2-3 mm long and smaller seed pods 6-9 mm long.



Control

Prevent seed set for 5 years by grazing, mowing, pulling or applying herbicides.

Hand pull single plants in winter before flowering. For small infestations and grass dominant areas an annual application of 10 mL Tordon®75-D in 10 L water in early winter gives excellent control of existing plants and has residual activity to control seedlings. In bushland, 200 g/ha Lontrel®750 or 50 g/ha Logran® applied in early winter provides reasonably selective control. For hand spraying use 25 mL wetting agent plus 4 g Lontrel®750 or 1 g Logran® in 10 L water. Repeat annually for several years. Plant tall growing perennial species to reduce re invasion. It is relatively tolerant to glyphosate. Metsulfuron also provides good control but is less residual and less selective.



140 *Watsonia* species

IRIDACEAE

Description

Watsonias are tufted herbs with erect sword shaped leaves to 1 m in length which are produced annually from a corm. The flowering spike is usually unbranched and up to 2 m high with many large trumpet shaped flowers. Each flower has a curved tube and 6 spreading lobes 1.5-3.5 cm long, 3 stamens and a slender 6-branched style. Reproduces from a large corm and small bulbils that are mainly at the base of the leaves but occasionally also up the flower spike. Native to South Africa, now common in the south west. Watsonias are serious weeds of roadsides, watercourses and railway lines, often invading bushland. Flowers spring and early summer. Watsonias are often confused with *Chasmanthe* and *Crocosmia*. Native plants which (when not flowering) may be confused with *Watsonia* are Kangaroo Paws (*Anigozanthos* species) with darker green, fleshier, unribbed leaves, the older leaves often mottled with dark markings. The dried remains of flower spikes are broad and branched in the common south west Tall Kangaroo Paw (*Anigozanthos flavidus*).



Control

Grazing provides effective control. Cultivation to 100 mm provides good control if done after the old corm is exhausted and before the new corms form or before the flower stem emerges. A follow up cultivation is usually needed. Mowing and slashing are usually ineffective unless repeated very regularly. Dig up isolated plants and burn the corms and bulbils. Thick infestations are difficult to control manually.

100 g 2,2-DPA(740g/kg) plus 25 mL wetting agent in 10 L water is the preferred herbicide. It provides some residual control of seedlings and is more selective than 100 mL glyphosate plus 25 mL wetting agent per 10 L water. Apply from flower stem emergence to mid flowering for the best control. For large areas use 10 kg/ha 2,2-DPA(740g/kg) plus 0.25% wetting agent. In sensitive areas use a sponge glove with 1 L of glyphosate(450g/L) plus 2 L water. Eradication from an area can usually be achieved in 2-3 years. Start control at the top of the catchment to reduce re invasion by bulbils carried in water flows.

Replant shrub and tree species.



142 *Zantedeschia aethiopica*
ARACEAE

Description

Arum Lily has a tuft of dark green, shiny, somewhat succulent leaves arising from tuberous roots. The leaf blades are heart-shaped to arrow-shaped and usually about 25 cm long on a stalk almost as long. Easily recognised by its conspicuous large white funnel-like "flower" about 10 cm across, which has a central pencil-like column of minute male and female flowers. In fruit the tiny female flowers at the base of this column are replaced by orange-yellow berries.

Native to South Africa, Arum Lily is a common and widespread serious weed of pasture and bushland, particularly of damp areas but also invading drier sites. The berries are spread by birds. Arum Lily may be toxic to stock. Flowers mostly late winter and spring.

This very distinctive plant is not likely to be confused with any native species.

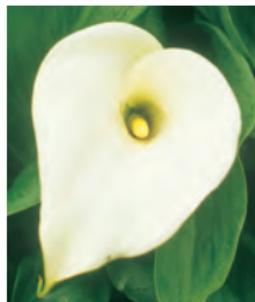


Control

Mechanical removal is only effective if all the root fragments are removed. Multiple rotary hoeing over a few years provides control. Cut flowers to prevent birds spreading seed. Encourage control on a district basis to reduce re infestation.

Herbicides provide the most effective control.

Use 1 g chlorsulfuron(750g/kg) plus 10 mL 2,4-D amine(500g/L) plus 25 mL Pulse® per 10 L of water. Spray plants until just wet in late winter before the flowers start to wither. Repeat annually. Alternatively, use 1 g metsulfuron(600g/L) plus 25 mL Pulse® per 10 L water as above. In sensitive areas a blanket wiper may be used to apply these products. Glyphosate is relatively ineffective.



144 *Asparagus species* ASPARAGACEAE

Description

Climbing, usually perennial herbs but the stems dying back in summer and replaced with a spurt of growth over autumn and winter. Stems are usually much-branched. The true leaves are reduced to scales, the leaf-like structures called cladodes are single or grouped in clusters at each axil. The flowers are usually white, bisexual or unisexual, each with 6 free petals and 6 stamens. The fruits are succulent berries.

There are a few other climbing species which may be confused with *Asparagus* species. Slender Clematis (*Clematis linearifolia*) differs in having opposite leaves which are divided into 3 stalked leaflets and fruitlets in a head (each fruitlet with a long feathery awn). Lignum (*Muehlenbeckia* species) differ in having tiny flowers in clusters, each flower with 5 petals. *Billardiera* species differ in their more leathery leaves, flowers with 5 sepals and 5 petals and fruits which are hard rather than succulent and usually more or less cylindrical in shape. *Selliera radicans* is not a climber but is creeping along the ground with roots at each node and also has stalked leaves and fan-shaped flowers.

A key for the weedy *Asparagus* species

1. 'Leaves' very narrow up to 0.5 mm wide and flat to circular in section. Berries translucent white, blue-grey or black when ripe.
 2. Stems not spiny. Berries translucent white to blue-grey and egg-shaped.
'Leaves' in groups of 3 per axil. Tubers present..... *A. declinatus* (Bridal Veil)
 2. Stems with recurved spines. 'Leaves' in groups of 8-15 per axil.
Berries black and globular. Tubers absent..... *A. plumosus* (Ferny Asparagus)
1. 'Leaves' broader, 0.5-30 mm wide. Berries orange to red or purple when ripe.
 3. 'Leaves' usually single along the stem, egg-shaped to heart-shaped and 4-30 mm wide... *A. asparagoides* (Bridal Creeper)
 3. 'Leaves' always clustered, 0.5-3 mm wide, usually 1 longer than the others.
 4. Stems spiny. 'Leaves' 2-3 mm wide. Flowers bisexual..... *A. aethiopicus* (SA Asparagus Fern)
 4. Stems without spines. 'Leaves' 0.5-1.5 mm wide. Flowers unisexual..... *A. scandens* (Climbing Asparagus Fern)

146 *Asparagus aethiopicus*

ASPARAGACEAE

Description

South African Asparagus Fern is a perennial prickly scrambler with annually renewed shoots and a rootstock with many tubers. The spines are 2-10 mm long in the axils of the branchlets of older stems. 'Leaves' 2-5 per axil, narrowly elliptic, straight to slightly curved, 1.5-2.5 cm long and 2-3 mm wide, usually 1 much longer than the others. The flowers bisexual, white to pinkish with petals 3-4 mm long. Berries globular, red when ripe, 5-8 mm across.

Native to southern Africa, South African Asparagus Fern is now an invasive weed along the south coast. Flowers March to April.



Control

Manual control is very difficult due to extensive tuberous root system which requires removal and somewhat spiny stems.

Burial is not usually effective. Applying a mix of 1 L glyphosate(450g/L) plus 2 L water to leaves and stems with a sponge glove or brush taking care to avoid other species is slower but may be more selective.

Grazing or persistent removal of the tops for several years exhausts the tubers. Intense fire can kill some of the tubers and clear the area to allow spraying of the regrowth with 100 mL glyphosate (450 g/L) plus 1 g metsulfuron in 10 L water before other species germinate or re-shoot.

Replant shrub species.

TO BE CHECKED



South African 147 Apsaragus Fern

Vines

148 *Asparagus asparagoides* ASPARGACEAE

Description

Perennial climber with annually renewed stems sprawling aggressively for several metres and climbing quite high into trees. The rootstock is tuberous. Spines absent. Bridal Creeper has shiny egg-shaped to heart-shaped 'leaves' 1 to 7 cm long and 4-30 mm wide. Flowers are white, bisexual, with petals 5 mm long. Each flower has 6 stamens with orange to red anthers. The berries are globular, red to purple when ripe and 6-10 mm across.

Native to southern Africa, Bridal Creeper is an extremely invasive environmental weed. A variant with somewhat larger 'leaves' which have a waxy appearance and larger tubers forming a rosette has been found in SA and Vic. This variant is resistant to the rust fungus which has provided considerable control of the common variety in most areas. It flowers in spring, dies back over summer and then shoots away in autumn. The bright berries are quickly spread by birds.



Control

Manual control is very difficult. Introduce and encourage biocontrol agents. Very low rates of 2 g/ha metsulfuron(600g/kg) plus Pulse® or 0.02 g metsulfuron plus 25 mL Pulse® per 10 L water provides good suppression and may be applied with a mister or hand spray in winter with little damage to the bush. No effect is seen until the following season when only a few stems emerge. Retreat or manually remove these stems and burn the tubers and root system. Burial is not usually effective. Applying a mix of 1 L glyphosate(450g/L) plus 2 L water to leaves and stems with a sponge glove or brush taking care to avoid other species is slower but may be more selective. Grazing or persistent removal of the tops for several years exhausts the tubers. Concentrate on reducing the vertical growth because this is where most seed is set. Mulching encourages seed to germinate. Intense fire can kill the tuber and clear the area to allow Bridal Creeper spraying before other species germinate or re-shoot. Replant shrub species.



Vines

150 *Asparagus declinatus* (*crispus*)
ASPARAGACEAE

Description

Bridal Veil is a scrambling or weakly climbing perennial with annually renewed shoots (shoots die off over summerXXX) arising from a tuberous rootstock. The stems are slender and spines absent. The 'leaves' are 3 per axil, linear, soft, 3-10 mm long and 0.25-0.5 mm wide. The flowers are bisexual, greenish white with the petals 5-6 mm long. Berries egg-shaped, translucent white to blue-grey when ripe, 10 mm long and 7 mm wide.

Native to southern Africa, Bridal Veil is now an invasive weed of roadsides and disturbed woodlands with potential to become a serious environmental weed. Flowers in autumn and winter.



Control

Manual control is very difficult because the tuberous root system must also be removed. Burial is not usually effective. Spray until just wet with a mix 100 mL glyphosate(450g/L) plus 1 g metsulfuron (600 g/L) in 10 L water during winter before flowering.

Grazing or persistent removal of the tops for several years exhausts the tubers. Intense fire can kill some of the tubers and clear the area to allow spraying of the regrowth with 100 mL glyphosate (450 g/L) plus 1 g metsulfuron in 10 L water before other species germinate or re-shoot.

Replant shrub species.

TO BE CHECKED



152 *Asparagus plumosus* ASPARAGACEAE

Description

Ferny Asparagus is a perennial climber with annually renewed stems reaching high into trees. The rootstock is fibrous and lacks tubers. Recurved spines are present along the stems and may be up to 2 cm long. 'Leaves' 8-15 per axil, narrow and flattened to circular in cross-section, 4-10 mm long and 0.5 mm wide. The flowers are bisexual, green or cream to white with petals 3-7 mm long. The berries are globular, black when ripe and 4-5 mm across.

Native to southern Africa, a serious weed of roadsides and woodlands. Flowers probably spring to autumn.

Control

Manual control is difficult due to the spiny nature of the stems.

Burial and burning is not usually effective. Applying a mix of 1 L glyphosate(450g/L) plus 2 L water to leaves and stems with a sponge glove or brush taking care to avoid other species is slower but may be more selective.

Grazing or persistent removal of the tops for several years exhausts the tubers. Concentrate on reducing the vertical growth because this is where most seed is set. Mulching encourages seed to germinate.

XXX Intense fire can kill the top growth but it reshoots and clear the area to allow spraying before other species germinate or re-shoot.

Replant shrub species.

TO BE CHECKED

154 *Asparagus scandens*
ASPARAGACEAE

Description

Climbing Asparagus Fern is a perennial climber with a rootstock having many tubers. Spines on the stems are absent. The 'leaves' are 1-3 per axil, narrowly elliptic, 5-15 mm long and 0.5-1.5 mm wide, usually 1 in each cluster much longer than the others. Flowers unisexual, the male and female flowers on separate plants, white to pinkish with petals 3-4 mm long. The berries are egg-shaped, orange to red when ripe and 5-7 mm across.

Native to southern Africa, an invasive weed of bushland, roadsides and creeklines. Flowers in September.



Control

Manual control is very difficult because the rhizomes above the tubers must be removed to prevent reshooting.

Burial is not usually effective. Applying a mix of 1 L glyphosate(450g/L) plus 2 L water to leaves and stems with a sponge glove or brush taking care to avoid other species is slower but may be more selective. Overall spraying with a mixture of 100 L glyphosate (450g/L) plus 1 g metsulfuron (600g/kg) in 10 L water is effective but will kill most companion plants that have their foliage sprayed.

Grazing or persistent removal of the tops for several years exhausts the tubers. Mulching encourages seed to germinate ???.

Intense fire can kill the tuber and clear the area to allow spraying before other species germinate or re-shoot. Replant shrub species.



155 Climbing Apsaragus Fern

Vines

156 *Cuscuta campestris*
CUSCUTACEAE

Description

Parasitic twiner with thread-like yellow to orange stems. The tiny, white to cream flowers are in dense clusters. Each flower (only 2-4 mm long) is bell-shaped, 5-lobed and has 5 stamens.

Native to North America, this weed can be a problem smothering vegetation near Albany and Pemberton and is a declared plant. It has been recorded as a parasite on both introduced and native plants especially *Muehlenbeckia adpressa*.

Native species with which Golden Dodder may be confused are Dodder Laurels (*Cassytha* species) which are also parasitic twiners but differ in their paler colour (not bright yellow to orange), at least some green stem, and in having 3 petals and 6 or 9 stamens.

Cuscuta planiflora and *Cuscuta epithymum* are similar weeds and should be reported when found.



Control

Manual removal is a waste of time and usually spreads the Golden Dodder.

Remove host plants for 3 to 5 years. Grow species that are not attacked by Golden Dodder such as grass or woody species. Good control of broadleaf weeds in these areas is essential to stop Golden Dodder surviving. In areas that can't be replanted, application of picloram based herbicides provides residual control of broadleaf plants with little effect on grasses. Patches can be treated by spraying host plants, plus a 5 metre buffer area, until just wet, with a mixture of 100 mL of Grazon® plus 25 mL Pulse® per 10 L of water when the hosts are actively growing. Repeat this annually for five years or when broadleaf plants germinate. Replant woody native species in bushland areas.



158 *Dipogon lignosus*

PAPILIONACEAE (FABACEAE)

Description

A robust climber with alternate leaves divided into 3 broadly triangular leaflets each 2-7 cm long. Dolichos Pea has many clusters of large pea flowers. The flowers are white or pink to purple, 8-15 mm long. The flat seed pod is 2-4.5 cm long and 7-9 mm wide.

Originally from South Africa it is commonly grown in gardens and has become a weed in disturbed areas especially near the coast. Flowers in spring and early summer.

Native plants which may be confused with Dolichos Pea (when not flowering) are Common Clematis (*Clematis pubescens*) and Wild Sarsaparilla (*Hardenbergia comptoniana*). Clematis, however has opposite leaves divided into 3 leaflets, white to cream 5-petalled flowers and a feathery head of small fruitlets. Wild Sarsaparilla has a yellow green "eye" on one of its blue to purple (rarely white) petals.



Control

Manual removal is difficult because of the perennial nature of the plant, its rhizomes and extensive taproot which may re sprout if damaged, the quantity of seed that has been set before control and its dormancy. In addition many infestations are intermingled with companion species and trees making access and effective removal of roots difficult. Small plants can be hand pulled but larger plants tend to break off and regrow. Cultivation with disc implements over the summer and repeated when seedlings appear for a few years should be effective in open situations. Fencing degraded areas and grazing heavily with sheep for several years could also be effective. Slashing is not likely to be very practical or effective. Hot fires can kill plants but re-shooting often occurs after moderate fires. A massive germination of seed often occurs after burning.

Herbicide treatments are likely to be useful to reduce the infestation to levels that can be controlled by manual removal. In severely degraded areas, 100 mL of Tordon®75-D plus 25 mL Pulse® in 10 L of water and spraying until run off in August, followed by burning and soil disturbance in autumn and repeated annually for 3-4 years is expected to give control. This treatment will damage many broad-leaved companion plants and the area may require rehabilitation. Lontrel® could provide selective control in Eucalypt based areas but is likely to severely damage Acacias. 10 g metsulfuron(600g/kg) plus 25 mL wetting agent in 10 L water should provide control but usually damages companion plants. Logran® whilst more selective has potential action on Dolichos Pea. Research is required to formulate a safe and effective control program xxxfor bushland.



160 *Vinca major*

APOCYNACEAE

Description

Sprawling ground-cover with dark green opposite leaves. The leaves are 2-7 cm long and have a shiny upper surface. The single long-stalked flowers are blue to violet with a white throat. The flowers are 3-5 cm in diameter, tubular with 5 radiating petal lobes. Each flower has 5 stamens hidden within the flower tube.

A garden escape sometimes found invading damp shady areas such as creeklines in disturbed woodland and paddocks. The plants are able to cover large areas by producing roots where the stems are in contact with the ground. Native to the Mediterranean region and widely cultivated in Australia. It flowers mainly from winter to early summer.

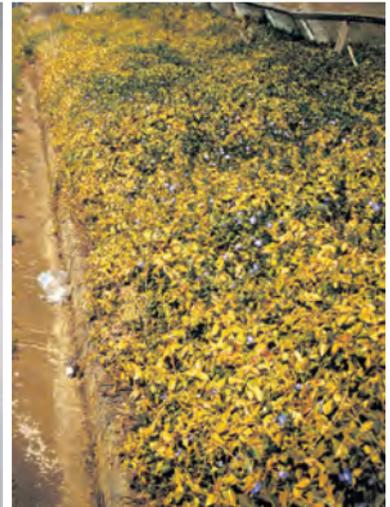
It can be toxic to stock.



Control

Mow or cut the vines (after a raking to lift the vines off the ground) in early to late spring. Spray the regrowth with a mixture of 100 mL glyphosate(450g/L) or 50 mL of dicamba(200g/L) plus 25 mL Pulse® in 10 L water. Several applications about 3 months apart are usually required. Spot spray or manually remove the last remnants of plants because these will be the source of re-infestation. Hot fires and solarisation provide some control.

XXX



162 *Acacia* species

MIMOSACEAE

Description

Several species of Wattle (*Acacia* species), which are native in eastern Australia, have been planted in WA in gardens, on farms as windbreaks or in early rehabilitation work and some of these have become particularly invasive weeds.

Cootamundra Wattle (*Acacia baileyana*)

Cootamundra Wattle is a shrub or tree to 10 m high with smooth grey to brown bark and silvery to blue-grey foliage. The main leaf axis is 1-2.5(3) cm long and has 2-6 pairs of branches, each of these side axes is divided into 8-24 pairs of small leaflets. The leaflets are 5-8 mm long and 0.7-1.6 mm wide, hairless. The golden globular flower heads are 7 mm across and arranged in large 8-30-headed sprays. The seed pods are flat, 3-10 cm long and 8-15 mm wide. Native to New South Wales Cootamundra Wattle is widely cultivated and now a weed of roadsides and woodland. Flowers in winter.

Possibly confused with the native Karri Wattle (*Acacia pentadenia*) but Karri Wattle has darker green foliage, only 2-4 flower heads per leaf axil and smaller pods 2-5.5 cm long and 3-4 mm wide. Cootamundra Wattle may also be confused with Albizia (*Paraserianthes lophantha*) which has dark green foliage with broader leaflets 1.5-3 mm wide and large cylindric flower heads 3-6 cm long.



Silver Wattle (*Acacia dealbata*)

Silver Wattle is a shrub or tree to 30 m high with grey to brown smooth bark (becomes rough with age) and silvery minutely hairy upper branchlets. The leaves are blue-grey to silvery when young and have tiny hairs. The main leaf axis is (1)4-12(17) cm long and has 6-30 pairs of branches, each of these side axes is divided into 10-68 pairs of small leaflets. The leaflets are (0.7)1.5-6 mm long and 0.4-1 mm wide, minutely hairy. The pale yellow globular flower heads are 5 mm across and arranged in 10-40-headed sprays. The seed pods are flat, 5-10 cm long and 7-14 mm wide.

Native to New South Wales, Victoria and Tasmania, Silver Wattle has become a problem weed along roadsides and in Karri forest in the Porongurup Range. Flowers late winter and spring.

The native species *Albizia* (*Paraserianthes lophantha*) differs in its darker green foliage with larger leaflets 5-10 mm long and 1.5-3 mm wide, and also in its much larger cylindrical flower heads which are 3-6 cm long.



164 *Acacia* species

MIMOSACEAE

Black Wattle (*Acacia decurrens*)

Shrub or tree to 10 m high with black or brown often fissured bark and dark green foliage. The main leaf-axis is 2-12 cm long and has 3-13 pairs of branches, each of these side axes is divided into 15-45 pairs of narrow leaflets. The leaflets are 5-15 mm long and 0.4-1 mm wide, hairless. The golden globular flower heads are 5-7 mm across and arranged in 10-45-headed sprays. The seed pods are flat, 2-10.5 cm long and 4-8.5 mm wide. Native to New South Wales Black Wattle, a garden escape, now a weed of roadsides and waste land sometimes invading disturbed woodland particularly along creeks. Flowers in spring. Black Wattle may be distinguished from the native Karri Wattle (*Acacia pentadenia*) by its longer leaflets (only 3-6 mm long in Karri Wattle), and by the greater number of flower heads in each inflorescence (2-4 flower heads per axil in Karri Wattle). The native species Albizia (*Paraserianthes lophantha*) differs in its broader leaflets 1.5-3 mm wide and its larger cylindrical flower heads, 3-6 mm long.



Mountain Cedar Wattle (*Acacia elata*)

Mountain Cedar Wattle is a tree to 20 m high with fissured or rough grey to black bark and green foliage with pale flattened hairs. The main leaf-axis is (3)8-22 cm long and has 2-7 pairs of branches, each of these side axes is divided into 8-22 pairs of leaflets. The leaflets are dark green on the upper surface and paler and quite hairy on the lower surface, each is 10-60 mm long and 3-13 mm wide. The pale yellow to cream, globular flower heads are arranged in sprays. The seed pods are flat, 4-17.5 cm long and 9-15 mm wide, with prominent margins.

Native to New South Wales and commonly planted as an ornamental or windbreak, it is now a weed invading forest and woodland. Flowers in summer.

Differs from the native Karri Wattle (*Acacia pentadenia*) in its longer leaflets (only 3-6 mm in Karri Wattle) and in its large sprays of flower heads (reduced to 2-4 heads per leaf axil in Karri Wattle). The native species *Albizia* (*Paraserianthes lophantha*) has smaller leaflets 5-10 mm long and 1.5-3 mm wide and also has large cylindrical flower heads 3-6 cm long.



166 *Acacia* species

MIMOSACEAE

Flinders Range Wattle (*Acacia iteaphylla*)

Flinders Range Wattle is a shrub to 5 m high with smooth, greenish bark, weeping branchlets and grey-green foliage. The leaves are replaced by fairly narrow undivided leaf-like phyllodes. The phyllodes are 5-14 cm long and 3.5-8 mm wide, each face with a single prominent longitudinal vein (midrib). The pale to lemon yellow flower heads are globular and arranged in a 6-16-headed spray, each head with 12-17 flowers, when young the inflorescence is enclosed by broad concave bracts with brown tips. The seed pods are usually straight and 6-12 cm long and 6-12 mm wide.

Native to South Australia, commonly cultivated and now a weed of disturbed woodland near settlement or refuse disposal areas. Flowers in winter.

The native Myrtle Wattle (*Acacia myrtifolia*) has usually broader phyllodes 4-30 mm wide, reddish young shoots and branchlets and flower heads which have very few (2-5) flowers per head and only 4 sepals and 4 petals to each flower.



Sydney Golden Wattle (*Acacia longifolia*)

Shrub or small tree to 10 m high with dark grey bark and green foliage. The leaves are replaced by undivided leaf-like phyllodes 6-20 cm long and 0.5-2 cm wide, each face with 2 or 3 longitudinal veins. The yellow flower heads are cylindric in shape, 2-4.5 cm in length and occur 1 or 2 together in the phyllode axils. The seed pods are 5-12 cm long and 3-6 mm wide, thick and usually straight to slightly curved.

Native to New South Wales and Victoria, now a troublesome weed of roadsides and creeks, invading bushland around Albany. Flowers winter and spring. The closely related Coastal Wattle (*Acacia longifolia* subsp. *sophorae*) which is also native to eastern Australia, is weedy from Albany to east of Manypeaks. Coastal Wattle has fleshier phyllodes 5-12 cm long and 1-3 cm wide, cream flower heads and curved to somewhat contorted seed pods.



168 *Acacia* species

MIMOSACEAE

Mearnsi Black Wattle (*Acacia mearnsii*)

Mearnsi Black Wattle is a tree or shrub to 15 m high with black or grey bark which is usually smooth but may be rough towards the base of the trunk. The foliage is dark green. The main leaf-axis is 3-13.5 cm long and has 7-31 pairs of branches, each of these side axes is divided into 25-78 pairs of small leaflets. The leaflets are 1-4 mm long and 0.5-0.8 mm wide, minutely hairy on the lower surface. The pale yellow to cream, globular flower heads are 10 mm across and arranged in 1-80-headed sprays. The seed pods are 3-15 cm long and 4-9 mm wide, shortly hairy, circular in cross section and quite deeply constricted between the seeds. Native to south eastern Australia, planted as an ornamental and also for its bark which was used in the tanning industry, now an environmental weed. Flowers in spring and summer.

The native Karri Wattle (*Acacia pentadenia*) differs in its larger leaflets 3-6 mm long and by its reduced inflorescences with only 2-4 flower heads per leaf axil. The native species Albizia (*Paraserianthes lophantha*) differs in its larger leaflets 5-10 mm long and 1.5-3 mm wide and also in its large cylindrical flower heads 3-6 cm long.

XXX Australia National Botanic Gardens has a picture



Blackwood (*Acacia melanoxylon*)

Blackwood is a large tree to 30(45) m high with dark grey fissured bark and dark green foliage. The leaves are replaced by undivided leaf-like phyllodes. The phyllodes are 4-16 cm long and 6-25 mm wide, often asymmetrical or somewhat curved, each face with 3-5 prominent longitudinal veins. The globular cream flower heads 5-7 mm across are in short sprays of 3-5 heads. The seed pods are up to 15 cm long and 3-8 mm wide, coiled and twisted. Each seed is encircled by a bright pink or red stalk.

Native to eastern Australia, Blackwood is a troublesome weed of swamps between Augusta and Albany. It may form dense thickets after disturbance. Flowers in spring. The native Coastal Wattle or Red-eyed Wattle (*Acacia cyclops*) has seeds with a similar red to orange encircling seed stalk and similar phyllodes but its inflorescences are reduced to 2 golden yellow flower heads per axil.



Wattles with simple

169 'leaves'

Trees & shrubs

170 *Acacia* species
MIMOSACEAE

Kangaroo Thorn (*Acacia paradoxa*)

Kangaroo Thorn is an intricate spiny shrub or small tree to 4 m high with dark brown finely fissured bark, weeping branches and ribbed branchlets. The leaves are replaced by undivided leaf-like phyllodes. The phyllodes are 8-20(30) cm long and 2-8 mm wide, shortly hairy, each face with 1 prominent longitudinal vein (the non-central midrib), the margins wavy. Two spines occur at the base of each phyllode and are 4-15 mm long. The globular golden flower heads are single (or rarely 2) per axil. The seed pods are 2-7 cm long and 3-5 mm wide, straight to slightly curved and shortly hairy. Native to eastern Australia and planted as an ornamental or hedge species, now a weed often forming dense thickets in high rainfall areas especially after fires. Flowers winter and spring.



Queensland Silver Wattle (*Acacia podalyriifolia*)

Queensland Silver Wattle is a shrub or small tree to 7 m high with grey smooth to finely fissured bark, branchlets which are white and usually velvety-hairy and silvery foliage. The leaves are replaced with broad undivided leaf-like phyllodes. The phyllodes are 1-4 cm long and 10-25 mm wide, usually hairy, each face with 1 prominent longitudinal vein (a non-central midrib), and wavy margins. The golden globular flower heads are arranged in 10-20-headed sprays each head with 15-30 flowers. The seed pods are brown with a white bloom, often velvety-hairy, up to 12 cm long and 10-20 mm wide, flat and often slightly twisted or wavy. Native to New South Wales and Queensland, widely planted as an ornamental, now a weed of roadsides and disturbed woodland often near settlement and refuse disposal areas. Flowers in winter.



171 Wattles with simple 'leaves'

Trees & shrubs

172 *Acacia* species

MIMOSACEAE

Golden Wattle (*Acacia pycnantha*)

Golden Wattle is a shrub or tree to 8 m high with dark brown to grey smooth bark and dark green foliage. The leaves are replaced by undivided leaf-like phyllodes. The phyllodes are 6-20 cm long and 5-35(50) mm wide, curved and asymmetric, leathery, hairless, each face with only 1 prominent longitudinal vein (midrib), the phyllode tip is blunt. The golden globular flower heads are arranged in showy sprays of 6-20 heads, each head with 40-80 flowers and a thick stalk 3-6 mm long. The seed pods are flat, 5-13 cm long and 5-7 mm wide, hairless, thick and fairly straight. Native to eastern Australia Golden Wattle has become a common weed of roadsides, sometimes invading bushland. Flowers in winter and spring. May be confused with the native Golden Wreath Wattle (*Acacia saligna*) but the latter has slightly narrower phyllodes, shorter sprays of flower heads with only 2-10 heads and also in its seed pods with thickened pale margins. The native Myrtle Wattle (*Acacia myrtifolia*) has shorter more erect phyllodes 2-13 cm long, cream to pale yellow flower heads with very few flowers (2-5) per head and each flower with only 4 sepals and 4 petals.



Control

In large dense stands a hot fire may be used to kill old trees and encourage seed to germinate so they may be controlled by herbicides or manually.

For species that tend not to sucker or resprout (e.g. XXX), cutting at the base, ringbarking or bulldozing and hand pulling seedlings provides good control. For other species, if hand pulling, ensure the roots are removed with the seedling by using a weeding fork. Herbicides usually provide better control.

For species with smooth bark (e.g. XXX) a basal bark treatment is often the most cost effective. For mature or juvenile trees, apply a mixture of 1 L of Access® in 60 L of diesel to the lower 50 cm of the trunk or inject the stems with 1 mL Tordon® Timber Control herbicide per 1.5 metres of height. Spring or when trees are actively growing is usually the best time for application.

Avoid further burning or denuding the area as this will encourage seedling establishment.

For seedling and juvenile trees to 1 metre tall, apply 4 L/ha of glyphosate(450g/L) plus 0.25% Pulse® or spray the foliage until just wet with a mixture of 100 mL of glyphosate(450g/L) plus 25 mL Pulse® per 10 L of water. Repeat the treatment every 2-3 years to ensure no trees reach an age where they can set seed. Lontrel®750 at 2 kg/ha for trees up to 2 metres tall may provide more selective control in many situations.

Some *Acacia* species may be more tolerant of glyphosate than others. If glyphosate is not providing good control then use Garlon®600, Lontrel®750, Starane® or Hotshot® at the same rates as glyphosate above. XXXX Most mature Acacias (except Silver Wattle) don't sucker when felled or ring barked, but hand pulled juveniles that have broken off often do re-shoot. A large number of seedlings often emerge in the season after felling or burning. If these are left the infestation may become worse. Don't buy or plant these species in gardens.

174 *Acacia* species

MIMOSACEAE

A key for weedy *Acacias* and similar native species

1. Adult leaves bipinnate (divided into small segments)
2. Foliage green to dark green (lower surface sometimes paler).
3. Leaflets 1.5-13 mm wide.
 4. Leaflets 3-10 mm long, oblong, straight and 1.5-3 mm wide. Inflorescence short or simple, of few flower heads.
 5. Whole leaf axis divided into 2-7 pairs of branches each further divided into small leaflets. Flower heads globular, 6-8 mm across..... *A. pentadenia*
(Karri Wattle)
 5. Whole leaf axis divided into 8-10 pairs of branches each further divided into small leaflets. Flower heads cylindric 30-60 mm long..... *Paraserianthes lophantha*
(Albizia)
 4. Leaflets 10-60 mm long, narrowly egg shaped and often curved, 3-13 mm wide. Inflorescence a large spray of many flower heads..... **A. elata*
(Mountain Cedar Wattle)
3. Leaflets 0.4-1 mm wide.
 6. Leaflets 1-4 mm long, adult leaflets hairless on upper surface and densely hairy on lower surface. Flowers pale yellow to cream. Pods circular in cross section, hairy and deeply constricted between seeds..... **A. mearnsii*
(Mearnsi Black Wattle)
 6. Leaflets 5-15 mm long, adult leaflets hairless or with a few marginal hairs. Flowers golden yellow. Pods flat, hairless and only slightly constricted between seeds..... **A. decurrens*
(Green Wattle)
2. Foliage silvery or blue-grey at least when young.
 7. Whole leaf axis 1-2.5(3) cm long and with 2-6 pairs of branches. Leaflets hairless, 5-8 mm long and 0.7-1.6 mm wide..... **A. baileyana*
(Cootamundra Wattle)
 7. Whole leaf axis (1)4-12 cm long and with 6-30 pairs of branches..
 - Leaflets 1.5-6 mm long and 0.4-1 mm wide, with hairs on the lower or both surface..... **A. dealbata*
(Silver Wattle)

A. pe
(Karri

1. Adult 'leaves' (phyllodes) undivided.
8. Phyllodes with 2-5 prominent longitudinal veins.
 9. Flower heads cylindric, 20-50 mm long, each flower with 4 sepals and 4 petals..... **A. longifolia*
(Sydney Golden Wattle)
 9. Flower heads globular, 5-7 mm across, the each flower with 5 sepals and 5 petals.
 10. Tree with fissured bark. Phyllodes usually curved. Inflorescence of 3-5 cream flower heads per axil..... **A. melanoxylon*
(Blackwood)
 10. Shrub, rarely a tree with smooth bark. Phyllodes usually straight.
Inflorescence of 2 golden yellow heads per axil..... *A. cyclops*
(Red-eyed Wattle)
8. Phyllodes with only 1 prominent longitudinal vein (midrib).
 11. Spines present, 2 at base of each phyllode. Inflorescence reduced to only 1 flower head per axil..... **A. paradoxa*
(Kangaroo Thorn)
 11. Spines absent. Inflorescence with 2-20 flower heads.
 12. Foliage silvery, phyllodes quite broad. Branchlets and also usually the phyllodes hairy..... **A. podalyriifolia*
(Queensland Silver Wattle)
12. Foliage not silvery. Branchlets and phyllodes hairless.
 13. Branchlets and young shoots reddish. Phyllodes not pendulous. Flower heads with few flowers (2-5 per head), each flower with only 4 sepals and 4 petals..... *A. myrtifolia*
(Myrtle Wattle)
 13. Branchlets and young shoots not red. Phyllodes often pendulous. Flower heads with many flowers (12-80 per head), flowers each with 5 sepals and 5 petals.
 14. Phyllodes narrow, 3.5-8 mm wide, not curved. Flower heads enclosed by conspicuous bracts when young. Flowers pale to lemon yellow..... **A. iteaphylla*
(Flinders Ranges Wattle)
 14. Phyllodes 4-35 mm wide, usually curved. Flower heads golden yellow without conspicuous bracts.
 15. Phyllodes tipped by sharp point, leaf stalk 1-3 mm long. Flower heads 2-10 per spray, each head on a slender stalk 5-15 mm long..... *A. saligna*
(Golden Wreath Wattle)
 15. Phyllodes with blunt tip, leaf stalk 5-8 mm long. Flower heads 6-20 per spray, each head on a thick stalk 3-6 mm long..... **A. pycnantha*
(Golden Wattle)

176 *Chamaecytisus palmensis*
PAPILIONACEAE (FABACEAE)

Description

Large shrub or small tree up to 5 m high with weeping branches and greyish green, softly hairy foliage. The leaves are divided into 3 oval leaflets each 10-45 mm long. The scented, white to cream pea flowers are each 12-17 mm long and occur in small showy clusters. The seed pod is flat, 40-50 mm long and 8-12 mm wide.

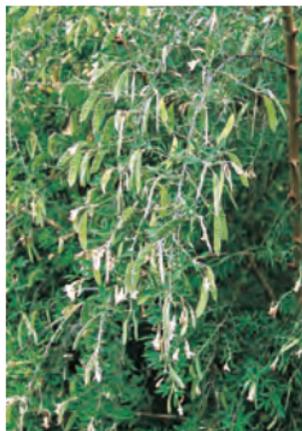
Tagasaste is native to the Canary Islands. Grown as a fodder plant, it has since become weedy along roadsides, sometimes invading bushland. It is common between Albany and Esperance. Flowers in winter and early spring. Seed may remain in the soil for more than 10 years but seedlings rarely establish in dense shade.



Control

Chain or bulldoze trees, burn, then spray regrowth and seedlings. Grazing can provide control by ring barking the trees and consuming the seedlings.

A mixture of 1 L of Access® in 60 L of diesel applied to the lower 50 cm of trunks can be used for individual trees. Seedlings (and trees) can be sprayed with a mixture of 0.5 g metsulfuron(600g/kg) plus 25 mL Pulse® in 10 L water in spring or autumn. Repeat annually until no more seedlings appear. This may take several years. 2 L/ha Tordon®75-D or 10 kg/ha Tordon®granules provide control of existing plants and residual control of seedlings but may affect other trees and scrub. 800 g/ha Lontrel®750 is preferred for use near Eucalypts. Replant to native species at least 12 months after the last spray and hand weed any Tagasaste seedlings as they appear. Metsulfuron and Tordon® will kill many native species it contacts at these rates. Glyphosate is relatively ineffective.



177 Tagasaste, Tree Lucerne

Trees & shrubs

178 *Dittrichia viscosa*
ASTERACEAE

Description

A woody perennial herb or shrub to 1.5 m high. The toothed leaves are sticky and often have an unpleasant smell when crushed. The yellow daisy flower heads are 8-20 mm across and have radiating petal-like florets. The tiny fruits are topped by a ring of fine bristles.

Native to the Mediterranean region, this species is now spreading along roadsides between Walpole and Jerramungup, particularly in swampy areas. Flowers in summer and autumn.



Control

Small areas can be mechanically removed. Plants in flower must be burnt as seed will develop from the reserves in the stem if left on the ground. Mowing reduces seeding and can eventually provide control if done regularly.

Spray plants with a mixture of 100 mL Access® in 10 L of diesel any time they are actively growing from spring to autumn. This treatment will kill most broadleaved species it contacts, however some selectivity can be achieved by only spraying the deep centre of each bush. In sensitive areas use 200 g/ha or 4 g Lontrel®750 plus 25 mL Pulse® in 10 L water as an overall spray in early summer.

It probably has allelopathic chemicals which reduce the growth of companion plants.

Infestations up-wind or up-stream may need to be controlled to prevent re-infestation.

It is relatively tolerant to glyphosate, metsulfuron and hormone herbicides.



179 False Yellowhead

Trees & shrubs

180 *Asclepias fruticosus*

ASCLEPIADACEAE

Description

Swan plant is an erect shrub to 2 m high producing a milky sap when damaged. The narrow leaves are opposite, 4-13.5 cm long, sparsely hairy and pointed. The flowers are white to cream and arranged in small, often pendulous clusters in the leaf axils. Each flower is 12-13 mm across, with 5 spreading to reflexed petals and a central crown of 5 pouch-like lobes. The inflated green fruit is egg-shaped, 4.5-6 cm long, and held on an S-shaped stalk. The fruit surface is covered with soft slender spines which are up to 15 mm long. Swan plant is native to South Africa, introduced as a garden plant for its attractive fruits, but has become a weed of roadsides, drainage lines, pasture and disturbed areas, sometimes invading undisturbed bushland. A declared noxious weed of W.A. Flowers spring and summer. Similar to and possibly confused with Balloon Cotton bush (*Gomphocarpus physocarpus*) which is also weedy, but has broader leaves and a more globular fruit borne on a straight stalk. Redhead Cotton



bush (*Asclepias curassavica*) has larger red flowers with a yellow central crown and a narrow fruit which lacks spiny outgrowths.

Control

Mechanical removal is effective if most of the root system is removed. Repeated cultivation provides some control. If possible, cultivate in autumn to encourage seed germination and lift crowns from the soil. Mowing or slashing in winter is effective if seedlings are sprayed or slashed as required. Grazing XXX

Seedlings can be controlled with 4 L/ha glyphosate or Grazon applied in spring to early summer when they are actively growing.

Spray foliage and a 1 meter buffer area until just wet with 100 mL Grazon plus 25 mL Pulse in 10 L of water in spring to early summer before flowering when the plants are actively growing.

This will control the parent plant and help control suckering and subsequent germinations. In bushland areas, wipe the leaves with a mixture of 1 L glyphosate plus 2 L water in spring to early summer before flowering when the plants are actively growing.

The larva of the Lesser Wanderer Butterfly occasionally causes significant damage to cotton bush.



181 Swan Plant or Cotton Bush

Trees & shrubs

182 *Lantana camara*

Family

Description

Lantana is a dense scrambling shrub to 3 m high with arched branches, the young growth with small prickles and stiff hairs. The leaves are opposite, egg-shaped to heart-shaped, 2-10 cm long and 1.5-8 cm wide, somewhat rough, prominently veined and shallowly toothed. The flowers are in dense, flat-topped clusters held on long stalks and range from cream, pink, orange, red, yellow to purple in colour. Each flower is 4-8 mm across, tubular with usually 4 spreading lobes and with 4 stamens hidden within the flower tube. The succulent fruit is black and 4-8 mm across.

Native to warm areas of both North and South America, introduced as an ornamental or hedge plant and now a weed of waste land near settlement. Lantana has become a serious bushland weed of eastern Australia as it is readily spread by birds and has the potential to form very dense thickets choking native vegetation. Flowers autumn and winter.

Control

Overall spraying is the most effective method of control. Spray, burn then spray regrowth for high levels of control. 1 L/ha Hotshot provides reliable control at most times of the year the plant is growing. Fluroxypyr, glyphosate, triclopyr,



2,4-D or picloram provide good control.

Small plants can be hand pulled. Larger plants are more difficult as the crown may fragment and root and stem pieces often regrow or are missed. Pull larger plants with a tractor and chain, try to remove as much root as possible and burn on site. Cut larger plants and paint with glyphosate or 1:60 triclopyr in diesel. Trace back branches to ensure they have not taken root where they touch the soil. Best results occur in warm wet periods of the year. Burn prunings so they don't start a new infestation.

Dozing and burning, followed by disking and establishment of dense, well fertilised, aggressive (perennial grass and legume) pasture species works well. Remnant Lantana is spot sprayed with 2,4-D and the remaining plants are manually removed. Alternatively, burn then spot spray regrowth when the canes are 300-1000 mm long after burning with 2,4-D, glyphosate or Grazon.

Basal bark spraying with triclopyr or picloram + triclopyr in diesel or 2,4-D amine or glyphosate in water also provide good control. Best results usually occur in autumn but work reasonably well all year round.

Soil applications of tebuthiuron also provides good control
Slashing and burning alone are ineffective and usually result in greater infestations.



184 *Lavandula stoechas*
LAMIACEAE

Description

Topped Lavender is an aromatic many-stemmed shrub to 1 m high with greyish foliage. The crowded leaves are opposite, narrowly oblong with the margin often curved under, 8-30 mm long, shortly hairy, strongly fragrant when crushed. The flowers are arranged in a dense cylindrical to 4-sided spike which is topped by large showy petal-like violet bracts. The individual flowers which are clustered below the terminal bracts are usually dark purple but occasionally pink or white, 6-8 mm long and tubular with 2 broad spreading lips. The fruit is of 4 tiny nutlets.

Topped Lavender is native to the Mediterranean, frequently cultivated as an ornamental or for its oil, but has now become a weed of roadsides, drainage lines, poor pasture and disturbed areas. Flowers in winter and spring.

French Lavender (*Lavandula dentata*) differs in its finely toothed leaves. English Lavender (*Lavandula angustifolia*) has a more elongated flower spike and lacks the showy bracts.



Control

Individual plants can be manually removed providing the main roots are also removed. Crowns and root fragments should be burnt. Larger areas can be ploughed in spring and repeated as new seedling or shoots emerge. Crowns and root fragments may re shoot. Competitive pasture species should be sown to reduce reinfestation by seedlings that will emerge for a number of years. Mowing and slashing can kill some plants and reduce the density of the infestation. It is tolerant to hormone herbicides.

Spray plants until just wet with 100 mL glyphosate (450g/L) in 10 L water.

Check Anne Prescott Shepherds Rise field day re control 0883360903



185 Topped Lavender

Trees & shrubs

186 *Leptospermum laevigatum*

MYRTACEAE

Description

A large shrub to 5 m high with greyish green foliage. The leaves are leathery, 15-30 mm long and 4-9 mm wide. The single white flowers have 5 small but broad petals spreading above a cup-shaped leathery base. There are numerous stamens apparently in a ring but actually in groups of 5-7, a group opposite each petal. The domed woody fruit opens by 7-10 valves to release its tiny seeds.

Native to eastern Australia, it is now a serious weed of roadsides and is invading bushland around Albany and also Esperance, particularly in sandy coastal areas.

West Australian native species of *Leptospermum* differ in having 3-5-celled fruits. Possibly confused with the native Silver Teatree (*Leptospermum sericeum*) of granite outcrops near Esperance, but differs in flower colour, Silver Teatree having pink flowers. The native *Homalospermum firmum* of wet areas in the west of the region differs in its narrower leaves, only 1-4 mm wide, as well as its fewer-celled fruits. Seedlings of Myrtle-leaved Milkwort (*Polygala myrtifolia*) and Coast Beardheath (*Leucopogon parviflorus*) look similar.



Control

Slash, fell or bulldoze thickets, then burn when dry. Spray regrowth until just wet with a mixture of 100 mL of Grazon® plus 25 mL Pulse® in 10 L of water. Individual plants can be controlled by applying a mixture of 200 mL of Access® in 10 L of diesel to the lower 50 cm of each trunk. Overall spraying with 100 mL glyphosate(450g/L) plus 25 mL Pulse® in 10 L of water is also effective. Seedlings can be manually removed in the first year or two. Older seedlings tend to break off and regrow. Small bushes tend to regrow when cut but older bushes tend to die. Plant shrub and tree species 2 years after the last spray to increase the levels of shade. Grazing will control seedlings.

Coast Teatree roots produce chemicals that reduce the growth of companion plants.



Coast Teatree

187 Victorian Teatree

Trees & shrubs

188 *Lycium ferrocissimum*
SOLANACEAE

Description

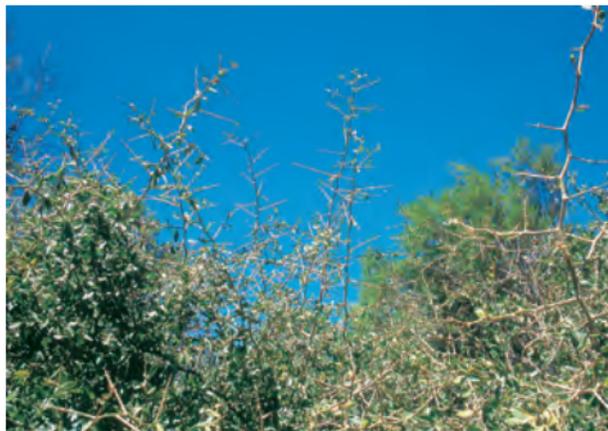
Shrub to 3 metres high, spiny and intricately branched. The slightly fleshy leaves are more or less oval, 7-25 mm long and clustered towards the tips of the rigid downward curved branches. The single, fragrant flowers are long-stalked and each have 4 or 5 rounded and spreading petal lobes which are pale lilac with darker purple centres.

There are 5 stamens which protrude from the white throat of the flower. The fruits are bright red drooping berries.

Native to South Africa, African Boxthorn is a problem weed along roadsides and in waste places in the east of the region and on islands of the Recherche Archipelago.

Flowers in spring.

The berries contain toxic alkaloids.



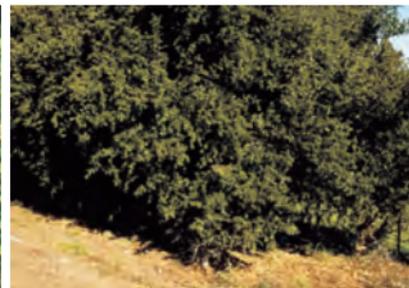
Control

Manual removal is difficult because it is so thorny and juveniles tend to break off and regrow from the roots, however it is the most common control method. Broken roots and stumps should be painted with 200 mL Access® in 10 L of diesel to control regrowth.

Individual bushes and a 5 m buffer area can be sprayed with a mix of 100 mL of Grazon® plus 25 mL Pulse® in 10 L water in late spring when the plants are actively growing.

This will control most existing plants and seedlings for about a year. Overall spraying with glyphosate is also effective but has no residual action.

Retreat regrowth and seedlings annually. Replant tall growing, perennial native species 2 years after the last spray. In some areas Boxtorn will be providing habitat for native animals and provision of alternative habitat or relocation may be required.



190 *Melaleuca armillaris*
MYRTACEAE

Description

Large shrub to 5 m high with hard or corky bark. Leaves alternate, somewhat leathery, linear, more or less flat, 12-25 mm long and 1 mm wide. The white (rarely pink) flowers are densely clustered into cylindric spikes 3-7 cm long. The individual flowers each have 5 small petals above a cup-shaped leathery base. The stamens are fused into 5 bundles, each bundle comprising 16-18 stamens. The fruits are closely clustered, each fruit 3-5 mm across and opening by 3 valves to release the tiny seeds.

Native to eastern Australia. Commonly grown in WA gardens but now considered a potential environmental weed. Flowers in summer.

As Bracelet Honey Myrtle has not yet been confirmed as naturalised in WA confirmation of identity should be obtained before destroying plants. There are several WA *Melaleuca* species with which it could be confused.

Albany Paperbark (*Melaleuca croxfordiae*) differs in its papery bark, generally longer leaves (25-40 mm long) and globular flower clusters. Swamp Paperbark (*Melaleuca raphiophylla*) differs in



its papery bark, needle-like leaves and smaller flower spikes 20-30 mm long. Broombush (*Melaleuca uncinata*) differs in its needle-like leaves and globular yellow flower spikes. Grey Honey Myrtle (*Melaleuca incana*) differs in having greyish and often broader leaves and more or less globular flower clusters. Robin Redbreast Bush (*Melaleuca lateritia*) differs in its scarlet to crimson flowers and larger fruits 7-8 mm across. Moonah or Modong (*Melaleuca preissiana*) differs in having papery bark and interrupted leafy flower spikes. Rottneest Teatree (*Melaleuca lanceolata*) also has interrupted leafy flower spikes. Rough Honey Myrtle (*Melaleuca scabra*) differs in its needle-like leaves and globular pink to purple globular flower clusters. *Melaleuca pentagona* differs in having pungent-tipped leaves and pink to purple globular flower spikes.

Control

Spray until just wet with a mix of 100 mL glyphosate (450g/L) + 1 g metsulfuron plus 25 mL Pulse in 10 L water.

Mechanical removal is effective.



191 Bracelet Honey Myrtle

Trees & shrubs

192 *Pelargonium capitatum*

GERANIACEAE

Description

An aromatic perennial herb or subshrub, softly hairy with broad almost circular leaves which are irregularly quite deeply lobed and have tiny pointed teeth around the margin. The pink to mauve flowers are in dense stalked clusters. Each flower is almost stalkless and has 5 petals. There are 10 stamens but only 3-8 of them fertile, the others reduced to antherless filaments. The fruits are long and beak-like, separating at maturity into 5 fruitlets with softly hairy awns which are curved or spirally twisted. Originating from South Africa, Rose Pelargonium is a garden plant which has become a weed in disturbed areas, particularly on sandy soils near the coast. Other garden varieties may persist around old buildings. Flowers winter to summer. Native species of Geranium or Pelargonium (*Pelargonium* species) can be distinguished by their undivided or very shallowly divided leaves whose margin has tiny rounded teeth. The flower clusters are looser than those of Rose Pelargonium, with each flower on a distinct slender stalk. Native species of Cranesbill (*Geranium* species) all have deeply dissected leaves and fewer flowers, usually only two together.



Control

Remove large plants and hand weed seedlings to prevent seed set for at least 3 years. Cultivation or blade ploughing provides effective control.

In bushland situations, 1 L/ha of 2,4-D amine(500g/L) or 20 mL 2,4-D amine(500g/L) in plus 25 mL wetting agent 10 L water provides reasonably selective control.

For small areas, spray the bushes and a 5 metre buffer strip with 100 mL of Tordon®75-D plus 25 mL Pulse® per 10 L of water. This will control seedlings for a year or two after spraying. When seedlings appear, repeat the treatment until no more seedlings emerge. This treatment has little effect on grasses so the area is not left bare but it will damage or kill most broad-leaved species in the sprayed area. Plant grasses in the area and introduce broad-leaved species two seasons after the last spray.

Glyphosate is relatively ineffective.



193 Rose Pelargonium

Trees & shrubs

194 *Phytolacca octandra*
PHYTOLACCACEAE

Description

Woody herb to 2 m high sometimes reddish tinged. The oval leaves are 4-25 cm long. It has several spikes of small greenish white flowers. The flowers have 5 petal-like sepals each 2.5-4 mm long. There are 7-10 stamens and 8 styles. The fruits are reddish black succulent berries.

Native to tropical America, Inkweed is now a weed of roadsides, creeklines, poorly-managed pastures and waste land where it is readily spread by birds. It flowers in spring and summer.

It contains a number of toxic compounds.

Control

Drag a railway iron or similar across heavy infestations to uproot the plants. Cut the roots about 5 cm below ground level to control isolated or remaining plants. Cultivation with discs is also effective.

In open areas, a blanket wiper applying 1 L glyphosate(450g/L) in 2 L water can be used.



Single plants may be sprayed with diesel. Small infestations may be treated with 100 mL Tordon®75-D in 10 L water. This will control existing plants and has residual activity for control of seedlings.

Larger infestations can be controlled with 50 g/ha metsulfuron(600g/kg) or 1 g in 10 L water for hand spraying. Half of these rates will control seedlings.

Infestations within 5 km of the target site will need to be controlled to prevent birds spreading seeds. Otherwise, seedlings will need to be controlled annually wherever birds roost. Seedlings may be manually removed but older plants tend to break off and regrow unless cut below ground level with a mattock.



195 Inkweed

Trees & shrubs

196 *Pittosporum undulatum*
PITTOSPORACEAE

Description

Pittosporum is a small bushy tree to 8 m high. The leaves are elliptic, 6-15 cm long and 1.5-4 cm wide, darker green on the upper surface and with somewhat wavy margins. The clustered flowers are bell-shaped, sweetly scented and white to cream in colour. The sepals are 6-10 mm long and hairy, the petals are 1-2 cm long. The fruits of *Pittosporum* are orange, hard, globular capsules which open to release brown seeds which are surrounded by a sticky pulp.

Native to south eastern Australia, an ornamental often used as a hedge plant and now an invader in gullies or forest and woodland and in bushland areas of fairly high rainfall. Flowers in spring.

The WA native species of *Pittosporum* (*Pittosporum phillyraeoides*) has narrower leaves only 6-16 mm wide, smaller flowers, small sepals only 1.5-3.5 mm long which are hairless apart from their margins,



petals 7-12 mm long and orange to red heart-shaped capsules. Pittosporum differs from Eucalyptus and Acacia tree species in its white-petalled flowers. Castor Oil Plant (*Ricinus communis*) differs in its very large and deeply lobed leaves to 40 cm across, its red female flowers and yellow male flowers and spiny fruit. Kangaroo Apple (*Solanum laciniatum*) differs in its deeply divided leaves and purple-blue flowers.

Control

Avoid burning areas that have a Pittosporum seed bank unless control of seedlings is planned for the following seasons. Control seedlings after fire by wiping with 1 part glyphosate(360g/L) in 2 parts water.

Paint lower 50 cm of trunk with a mixture of 100 mL Access® in 6 L of diesel, or fell tree and apply this mixture or neat glyphosate(360g/L) immediately to the cut stump.

Fell or doze, then burn thickets. Control seedlings by wick application of glyphosate. Replant a species to



198 *Polygala myrtifolia* & *virgata*
POLYGALACEAE

Description

Shrub to 2.5 m high with crowded light green elliptic leaves 1-5 cm long. The clustered pink to purple and white flowers are pea-like but the keel petal is crested and there are only 8 stamens. The fruit is a circular capsule.

Native to South Africa, a garden escape now invading bushland, particularly in sandy coastal areas.

Flowers spring and early summer.

Polygala virgata is another species which has become weedy. It differs in its narrower leaves and elongated sprays of flowers.

Seedlings of Coast Teatree (*Leptospermum laevigatum*) and the native Coast Beardheath (*Leucopogon parviflorus*) look similar.



Polygala virgata



Polygala virgata

Control

Seedlings and small plants can be removed manually. Larger plants can be cut off close to ground level and usually don't regrow. Fire will kill small plants and if intense enough it also kills larger plants and encourages seed to germinate. These need controlling in the following 3 seasons. Burning without follow up control usually leads to increased infestations.

100 mL glyphosate(450g/L) in 10 L water applied as an overall spray provides control. Spray infestations in winter to create dead material for a hot burn in spring if possible. Sprays are preferred in areas where disturbance may lead to erosion.



199 Myrtle-leaved Milkwort

Trees & shrubs

200 *Psoralea pinnata*
PAPILIONACEAE (FABACEAE)

Description

Shrub or small tree to 4 metres high with dark green foliage. The leaves have 5-11 very narrow leaflets 2-3 cm long, each dotted with tiny black glands. There are small clusters of fragrant pale blue pea flowers, each flower about 1 cm long and on a slender stalk. The seed pods are small, only 4-5 mm long.

Originally introduced from South Africa as a source of nectar for bees, *Taylorina* has become a common weed around Albany particularly along roadsides and creeklines. It extends west of Denmark. Flowers in spring and early summer.

Control

Aerial spray large trees with 80 g/ha of metsulfuron(600g/kg) plus 0.25% Pulse® in spring to early summer or fall, slash or doze these trees. Burn in autumn.



Treat seedlings in early summer with 50 g/ha of metsulfuron(600g/kg) plus 0.25% wetting agent for partially selective control or 6 L/ha glyphosate (450 g/L) for non selective control. For hand spraying use 1 g metsulfuron(600g/kg) plus 25 mL Pulse® in 10 L water or 100 mL glyphosate(450g/L) in 10 L water and spray foliage until just wet. Individual trees can be controlled by applying a mixture of 200 mL Access® in 10 L diesel to the lower 30 cm of trunks.

Trees with trunks that are less than 2 cm thick tend to re sprout when cut. Juveniles can be hand pulled fairly easily. A hot fire can kill plants but encourages a mass germination. Grazing controls seedlings. It will take many years to deplete the soil seed bank. New infestations should be treated promptly.



201 African Scurfpea, Taylorina

Trees & shrubs

202 *Rubus* species ROSACEAE

Description

Perennial plants with arching prickly stems (canes). The stems take root where they touch the ground, often forming dense thickets. The broad leaves are 3-15 cm long and divided into 3-5 toothed leaflets. The white or pink-tinged flowers each have 5 rounded petals 7-20 mm long and numerous stamens. The succulent and delicious fruits are an aggregation of numerous tiny fruitlets and are at first red but turn black as they mature. Native to Europe, Blackberry is a declared plant and a serious weed of creeklines, spreading into forest and woodland along creeklines. Flowers in spring and summer.



Control

Mechanical control is difficult and most of the root system must be removed for effective control. Burning is not effective apart from allowing better access.

It is difficult to eradicate. Three annual, summer applications of 100 mL of Grazon® plus 25 mL of Pulse® in 10 L of water has provided eradication on 30% of sites when assessed 10 years later. On large infestations, 1 g metsulfuron(600g/kg) plus 25 mL Pulse® in 10 L water, applied in summer when the Blackberry is actively growing, provides a cheaper option to reduce the size of the infestation before Grazon® is used.

Grazon will damage most broad-leaved species but is the only chemical that has provided reliable eradication. It has little effect on grasses so the area is not left bare and this also helps reduce seedling establishment.

100 mL glyphosate in 10 L water provides reasonable control and can be used in sensitive areas. Repeat as new growth appears. Trounce® (a mixture of glyphosate and metsulfuron) plus Pulse® is also effective. Grazing with goats is reasonably effective.

Replant native species after control has been achieved.

Biocontrol rust fungi have established but have had little impact.



204 *Solanum aviculare* & *laciniatum* SOLANACEAE

Description

Kangaroo Apple (*Solanum aviculare*)

Shrub to 4 m high, hairless. The lower leaves are 15-30 cm long and deeply lobed with pointed lobes, the upper leaves are smaller and usually unlobed. The flowers are lilac to purple in a long-stalked cluster, each flower 2.5-4 cm across. The conspicuous sprays of berries are orange to red, succulent, egg-shaped and 1-1.5 cm across.

Native to eastern Australia, now a weed of wasteland. It is found around Perth and Esperance. Flowers in summer.

A similar species, Madeira Winter Cherry (*Solanum pseudocapsicum*) differs in having entire leaves, white flowers and orange globular berries.

Large-flowered Kangaroo Apple (*Solanum laciniatum*)

Shrub to 3 m high, hairless. The leaves are 10-40 cm long, usually deeply dissected with pointed lobes although some remain unlobed. The flowers are purple, in a long-stalked cluster, each flower 2-3.5 cm across. The conspicuous drooping sprays of berries are yellow to orange-yellow,



succulent, egg-shaped and 1-1.8 cm across.

Native to eastern Australia, now a weed of rivers, creeklines and disturbed areas. It is quite common from Denmark to Cape Riche. Flowers in spring and summer.

Both *Solanum simile* and *Solanum symonii* are native species which may be confused with Kangaroo Apple. They are shrubs to 2 m high with entire to shallowly lobed leaves and stalked clusters of lilac to purple flowers, but their berries are green tinged with purple and sometimes becoming black with age.

Control

Apply a mixture of 150 mL Access® in 10 L diesel to the lower 50 cm of trunk of trees. Young actively growing seedlings can be overall sprayed with 1 L/ha Starane® or hand sprayed with 20 mL in 10 L water in late spring. Seedlings and young plants can also be hand pulled.

Control infestations within 5 km of the target area to reduce the spread of seed by birds. Plant perennial species which provide a good mulch on the soil. Grazing and mowing usually provide control. It tends to flourish in areas that have been recently fenced off and in new plantations.



206 *Solanum linnaeanum*
SOLANACEAE

Description

Apple of Sodom is a shrub to 2 m high, with very prickly and hairy stems and leaves. The yellowish spines are coarse, up to 15 mm long and the hairs are of two types, some star-shaped and some gland-tipped. The leaves are 4-15 cm long and deeply lobed, the lobes rounded and often with wavy or further indented margins. The flowers are pale purple in a short spray, each flower 1.5-3 cm across and with a hairy and prickly calyx. The berries are yellow eventually turning brown to black, succulent, globular and 2-3.5 cm across.

Native to northern and southern Africa and the Mediterranean, now a serious weed of roadsides, creeklines, wasteland and disturbed woodlands. Apple of Sodom is a declared weed in several states including W.A. The berries are toxic. Flowers in spring and summer.

Similar to the ornamental shrub White-edged Nightshade (*Solanum marginatum*), but the latter has silvery leaves which are less deeply lobed and have white margins, and also larger berries 3-4 cm across. Apple of Sodom is possibly confused with other prickly *Solanum* species. Silver-leaved Nightshade (*Solanum elaeagnifolium*) is a sparsely prickly perennial herb with entire to very shallowly lobed leaves and orange to brown berries up to 1.5 cm across. Buffalo Burr (*Solanum rostratum*) differs in its



annual habit, yellow flowers, and its berries which are almost hidden in the prickly calyx. Afghan Thistle (*Solanum hoplopetalum*) and (*Solanum hystrix*) are both extremely spiny sprawling herbs with pale blue to white flowers and their berries enclosed in the prickly calyx. Viscid Nightshade (*Solanum sisymbriifolium*) differs in its twice lobed leaves with many gland-tipped hairs, rusty coloured spines and red berries partly enclosed in the prickly calyx. There are many prickly native *Solanum* species in the Kimberley and Pilbara, but they have not become weedy in the south of the state.

Control

Apply a mixture of 120 mL amitrole in 10 L water and spray the bush until thoroughly wet. Seedlings and young plants can also be hand pulled with gloves. Cultivation followed by treatment of regrowth and seedlings with Tordon 75-D is effective.

Control infestations within 5 km of the target area to reduce the spread of seed by birds. Plant perennial species which provide a good mulch on the soil.



1. Leaves, stems and calyx without prickles or spines.
 2. All leaves entire or very shallowly lobed.
 3. Herb or short-lived small shrub. Berry 6-9 mm across, purple-black to black.
 4. Berry shiny when mature. Seeds 1-1.5 mm long, 40-50 per berry. Stems often angled or winged.. **S. americanum*
(Glossy Nightshade. p122)
 4. Berry dull when mature. Seeds 2 mm long, 25-35 per berry. Stems not angular..... **S. nigrum*
(Blackberry Nightshade p122)
 3. Shrub to 2 m. Berry 10-15 mm across, orange-red..... **S. pseudocapsicum*
(Madeira Winter Cherry. p204)
 2. Leaves some or most deeply dissected, some divided into individual leaflets
(upper leaves often less deeply lobed or even entire).
5. Annual or perennial herbs, often sprawling. Berry globular.
 6. Leaves cut deeply, some into individual leaflets. Berry green to purple or red, 10-150 mm across.
 7. Aromatic herb, sticky with gland-tipped hairs. Roots not tuberous. Flowers yellow. Berry red.... **Lycopersicon esculentum*
(Tomato)
 7. Non-aromatic herb, not sticky and hairs when present not gland-tipped. Roots develop
tubers (potatoes). Flowers white, pink to purple. Berry green or purplish..... **S. tuberosum* (Potato)
 6. Leaves shallowly to deeply lobed but not divided into individual leaflets.
Berry whitish green, 8-12 mm across..... **S. triflorum*
(Three-flowered Nighshade. p122)
5. Shrub to 4 m high. Berry egg-shaped.
 8. Stems often dark purple to black. Tips of petals notched. Berry yellow to orange-yellow..... **S. laciniatum*
(Large-flowered Kangaroo Apple. P204)
 8. Stems dark green with raised lines. Tips of petals pointed. Berry orange to red..... **S. aviculare*
(Kangaroo Apple. p204)

1. Leaves, stems and calyx with prickles or spines.
 9. Calyx enlarged in fruit and partly or completely enclosing the berry.
 10. Sprawling herb with no large star-shaped hairs. Leaves moderately to deeply lobed but not cut into individual leaflets.
 11. Leaves with few or no hairs..... **S. hystrix* (Afghan Thistle. p120)
 11. Leaves with many simple and gland-tipped hairs..... *S. hoplopetalum* (Afghan Thistle. p120)
 10. Erect herb to 1.5 m high. Lower leaves so deeply lobed that they form individual leaflets. which in turn may be lobed. Star-shaped hairs and gland-tipped hairs present.
 12. Flowers yellow. Berry black, 10 mm across..... **S. rostratum* (Buffalo Burr. p206)
 12. Flowers white to pale bluish purple. Berry red, 15-20 mm across..... **S. sisymbriifolium* (Viscid Nightshade. p207)
 9. Calyx not or somewhat enlarged in fruit but not enclosing the berry.
 13. Perennial herb. Leaves entire or only shallowly lobed. Spines 2-5 mm long, few, only on stems. Berry 8-14 mm across..... **S. elaeagnifolium* (Silver-leaved Nightshade. p206)
 13. Shrub. Leaves moderately to deeply lobed. Spines to 10 mm or 15 mm long, common on stems, leaves and calyx. Berry 20-40 mm across.
 14. Leaves dull green to silvery white, mostly 10-12 cm long. Flowers white to very pale mauve, 30-40 mm across. Berry 30-40 mm across..... **S. marginatum* (White-edged Nightshade. p206)
 14. Leaves dark green, mostly 4-8(10) cm long. Flowers pale purple-blue, 15-30 mm across. Berry 20-35 mm across..... **S. linnaeanum* (Apple of Sodom. p206)
- * = Introduced species

210 *Ulex europaeus*
PAPILIONACEAE (FABACEAE)

Description

A dense spiny shrub to 2 m high, erect and much-branched with coarse spiny branchlets and leaves reduced to thick spine-tipped phyllodes (although the seedlings have leaves with 3 leaflets). The showy, yellow pea flowers are borne singly and are 15-20 mm long. The hairy seed pod is somewhat compressed and 1-2 cm long.

Native to Europe and originally planted as a hedge, now a weed of wasteland and roadsides around Albany. Flowers autumn to spring. The seeds remain viable for many years and germination is encouraged by burning.

Control

Gorse is difficult to eradicate because it rapidly invades and seedlings will keep emerging for many years. Soil seed banks can exceed 10,000 seeds/m². An integrated program is likely to be most successful. Try to conduct an eradication campaign on a district basis to reduce seed being carried in by birds. Roll, hot burn, then cultivate established infestations if possible. Spray with 100 mL Grazon® plus 25 mL Pulse® in 10 L water when the plants are actively growing in spring to autumn. Establish vigorous grasses and fertilize with nitrogen. Graze with goats and spot spray trouble spots with Grazon®. On areas that can't be grazed, apply



Grazon® annually until few seedlings appear. Two years after the last Grazon® spray, replant species that will provide complete shade as quickly as possible. Control seedlings and small plants manually or spray with 100 mL glyphosate(450g/L) in 10 L water or paint with 1 L glyphosate(450g/L) in 2 L water. Large individual plants can be controlled by spraying a mixture of 200 mL Access® in 10 L diesel on the basal 50 cm of each main stem. Larger plants tend to break off and regrow. Burn material from manual control on site if possible.



212 Herbicides

2,2-DPA affects many grasses and monocotyledon species as a pre emergence or post emergence application. It has some residual action lasting for about 12 months. It causes little damage to many established native broad-leaved species and is used selectively as an overall selective spray on roadsides. It is absorbed by the leaves and roots.

2,4-D is a plant hormone herbicide. The amine form is water soluble, non volatile and generally used. The ester form is water and oil soluble, volatile and more likely to cause drift problems. Both affect broad-leaved annuals and young perennials. Most established plants tolerate them but may show symptoms. Grasses are tolerant. They have little residual activity and are absorbed by the leaves. A Department of Agriculture permit is required for spraying close to vineyards and commercial market gardens.

Access® contains triclopyr and picloram and is an oil soluble herbicide that is mixed with diesel and used mainly for control of woody weeds by application to the lower trunk. It affects most broad-leaved species it contacts and gains selectivity by its specific application to the target plant. It is absorbed by the leaves, roots and through bark. The picloram component is residual for a year or more but generally of little consequence because it is usually applied to the trunk rather than as a broadcast spray.

Amitrole affects many herbs and grasses post emergence, but is tolerated by young Eucalypts at low rates. It has virtually no residual activity and is absorbed by the leaves.

Arsenal® contains imazapyr and affects most species. It is particularly effective on the Iridaceae. It is residual and lasts in the soil for over a year. It is absorbed mainly through the roots and leaves.

Achieve® contains tralkoxydim and affects annual grasses post emergence. It is absorbed mainly through the leaves and has little residual activity.

Brodal® contains diflufenican and has pre and post emergence activity on broad-leaved annual species especially the Brassicaceae. It is residual and can control seedlings for over a year. It is absorbed through the roots and leaves.

Chlorsulfuron affects a wide range of herbs, annual grasses, bulbous plants and native plant seedlings. It has a soil residual life of 1-12 months depending on pH and is used as a pre emergence or post emergence herbicide. It is absorbed by the roots and leaves.

Dicamba affects broad-leaved species post emergence. It has virtually no residual action. It is absorbed by the leaves of plants.

Eclipse® contains metosulam and is very selective for controlling Brassicaceae species post emergence. It has limited residual action and is absorbed mainly through the leaves.

Fusilade® contains fluazifop and affects grasses post emergence. At high rates it will control many perennial grasses. It has little residual action and is absorbed mainly through the leaves.

Garlon® contains triclopyr and affects broad-leaved species including woody weeds and trees post emergence. It has little residual activity and is absorbed through the leaves or bark. It is also used as a cut stump treatment.

Glyphosate applied post emergence affects most species at high rates but can be quite selective at low rates where it will control many herbs and grasses with little effect on woody species. It is non residual and leaf absorbed and is also used as a cut stump application.

214 Herbicides

Grazon® comes in two common formulations containing triclopyr and picloram, the old Grazon® DS and a range of generic products and the new Grazon® Extra which also contains aminopyralid. They affect broad-leaved species especially woody species and trees. It has both pre

and post emergence activity and can be used as a cut stump treatment. At very high rates it may damage grasses also. The picloram component is residual and will provide action for a year or more. The aminopyralid component increases the activity on some species. Grazon® is absorbed by the leaves and roots.

Logran® contains triasulfuron. It controls a range of annual grasses and broad-leaved species as a pre emergence application and some broad-leaved annuals or perennial seedlings as a post emergence application. It is absorbed by the roots and leaves. Leaf absorption is usually enhanced by adding a spray oil.

Lontrel® contains clopyralid and is fairly selective with good post emergence action on the Asteraceae and some other broad-leaved species. It is absorbed mainly by the leaves. It has some residual action for a few days to weeks on some species.

MCPA is a leaf absorbed, broadleaf, plant hormone herbicide with little residual action.

Metsulfuron affects broad-leaved, fern, bulbous and some woody species post emergence. It is mainly absorbed through the leaves and may have residual action for a few days to weeks depending on soil pH. At high rates it may affect young grasses.

Pulse® is an organosilicone adjuvant that is particularly useful for improving herbicidal control of large woody species.

Select® contains clethodim and affects annual grasses post emergence. It is absorbed mainly through the leaves and has little residual action.

Simazine® is a soil residual herbicide that affects most seedlings at high rates for about 12 months. It is used as a pre emergence spray and at low rates it has more action on grasses than broad-leaved species. It has little effect

Spinnaker® contains imazethapyr and controls many annual broad-leaved and grass species as a pre or post emergence application. It has little effect on most established perennial species. It is absorbed by the roots and leaves. It has residual action lasting some months to a year.

Spray.Seed® contains paraquat and diquat and burns the leaves off most species. Perennial species usually recover. It is absorbed by the leaves and has no residual action. It is not generally used for back pack spraying because it is more toxic than most other herbicides.

Spray oil is an adjuvant that is added to help some herbicides penetrate the leaf.

Starane® contains fluroxypyr and has good post emergence action on Solanaceae species. It is absorbed by the leaves and roots and has a few days residual activity.

Targa® contains quizalofop and controls grasses post emergence. It causes little or no damage to broad-leaved species. It has a few days residual action. It is absorbed through the leaves.

Tigrex® contains MCPA, a plant hormone herbicide and diflufenican. It has pre and post emergence activity on a range of broad-leaved species but tends to be soft on the Papilionaceae. At higher rates it has residual activity that may be useful for over a year on Brassicaceae species. It is absorbed through the leaves and roots.

Tordon®75-D contains the plant hormone herbicides 2,4-D and picloram. It controls broad-leaved weeds and has a long residual life in soil.

Uptake® and Supercharge® contain a spray oil and emulsifier.

Verdict® contains haloxyfop and controls grasses and some Geraniaceae post emergence. It causes little or no damage to other broad-leaved species. It has little residual action and is absorbed through leaves.

Wetting agent is an adjuvant that is added to help herbicides stay on waxy leaves.

216 Glossary

anther: pollen-bearing part of a stamen (male organ of a flower)

awn: a slender bristle, often found on the reduced leafy parts (lemma) of grass florets

blade: leaf blade, the part above the petiole (stalk) or sheath

bulb: storage organ (usually underground), formed from a stem surrounded by fleshy leaves

bulbil: a small bulb or other propagating organ produced in the leaf axil or inflorescence of the aerial parts of a plant

calyx: outermost floral whorl of free or fused sepals that is commonly green.

corm: storage organ (usually underground), formed from a swollen stem base

cormel: small corm produced underground near a corm

cut stump application: applying herbicide to the stump of a freshly felled tree.

ellipsoid: a 3-dimensional oval shape

floret: small flower, either referring to the tiny flowers aggregated into a flower head (eg a daisy), or used to describe the reduced flower of a grass

hard seed: dormant seed that will not germinate for many months or seasons.

inflorescence: the arrangement of flowers on a stem

leaf axil: the angle between the leaf and stem

lemma: one of the reduced leafy parts of a grass floret

ligule: appendage at the junction of the blade and sheath of a grass leaf

overall spraying: herbicide is applied to target and surrounding vegetation

palmately divided: divided in the same way as a hand

petal: segment of the inner floral whorl, variously coloured

phyllode: a leaf whose blade is reduced or absent and whose petiole (stalk) assumes the function of the whole leaf

pinnately divided: divided in the same way as a feather

post em = post emergence application: applying herbicide to green growing plants.

pre em = pre emergence application: applying herbicide to soil before seeds germinate.

residual action: ongoing weed control of a herbicide weeks or months after spraying.

selective: herbicide that controls the weed with little effect on companion plants.

sepal: segment of the outermost floral whorl, commonly green

sheath: part of the leaf encircling and sheathing the stem

spike: a narrow inflorescence with several stalkless flowers

spikelet: part or all of a grass flower head, consisting of 1 or more florets

spray topping: application of herbicide at late flowering to control weed seed production

spur: an elongated tubular pouch of a flower

stamen: one of the male organs of a flower usually made up of the filament and anther.

style: the elongated part of the female organ of a flower

tillering stage: age of grass when it is producing secondary shoots or tillers.

tendrils: a climbing organ, a modified leaf part or stem

tuber: storage organ which is an underground stem or part of a root

tuberous: roots which are swollen and tuber-like

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XXX
Scale
ruler

Purpose

This sturdy booklet is designed for field workers who need to be able to identify the weed and apply effective control. Similar native plants are flagged to reduce the risk of accidental damage. Recipes for herbicide mixtures suitable for hand spraying are included and for broad acre spraying where appropriate. The emphasis is on non agricultural situations where control of small infestations may prevent a much larger problem in the future.

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