IDENTIFYING WESTERN AUSTRALIAN SUMMER WEEDS MANUAL

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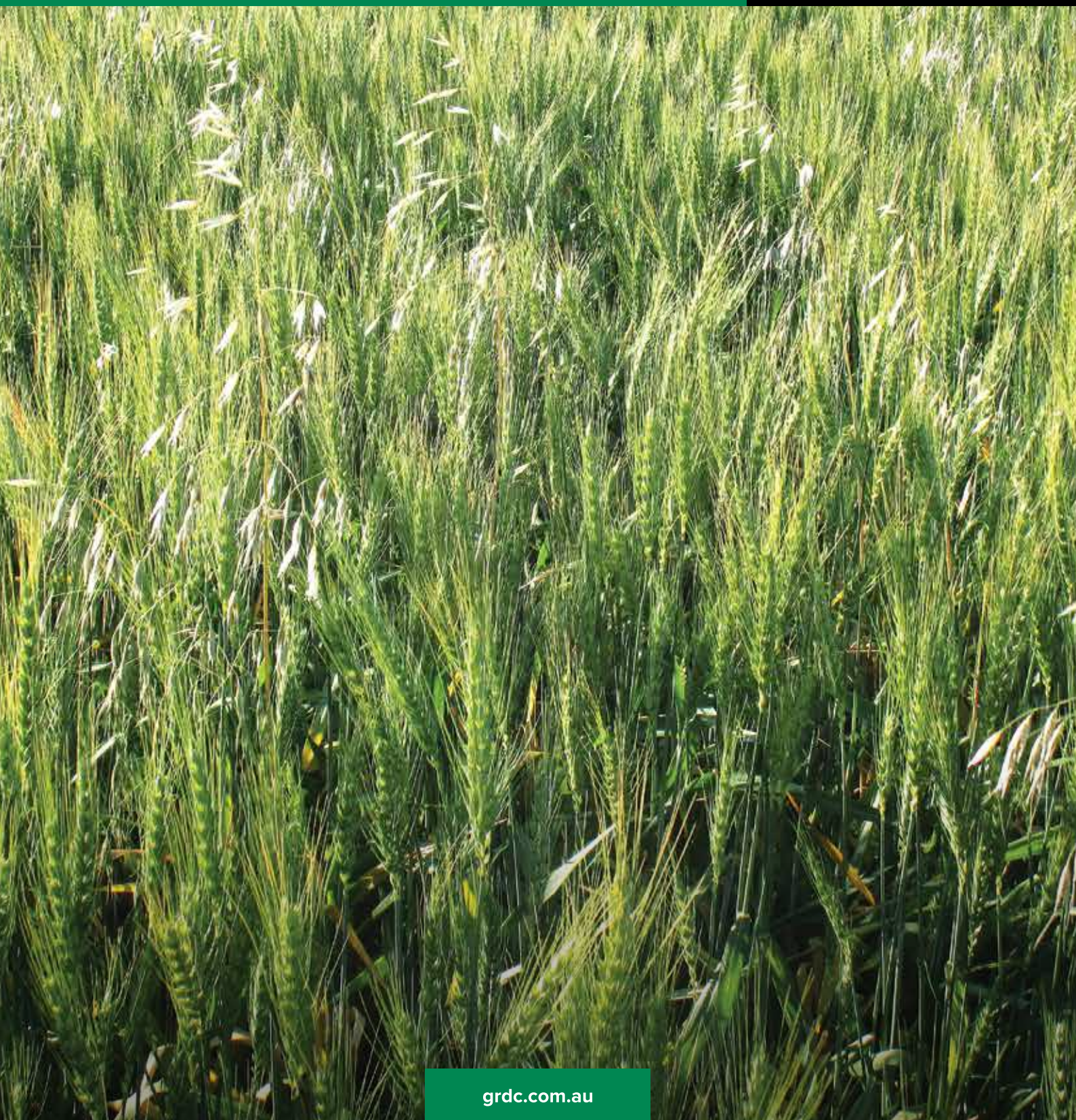
WESTERN



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Title: Identifying Western Australian Summer Weeds Manual

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Introduction

The suite of summer weeds present in the Western Australian grainbelt comprises many different species. This makes management decisions difficult and heavily reliant on correct species identification. This booklet aims to help in the identification of the common weeds found in the Western Australian grainbelt. Several weeds present in summer, such as common sowthistle, are able to germinate and reproduce throughout the year; the most common of these have been included along with weeds present only in summer.

Begin with the basics

The first requirement of successful weed management is correct identification. Misidentification leads to ineffective control practices, which is costly and often makes the problem worse.

Many people still identify weeds by their common names; however, this leads to problems because many species have multiple common names. Some names are only used within some states or even districts. For example, *Emex australis* is known as doublegee in Western Australia, three-corner jack in South Australia and spiny emex in New South Wales.

Another excellent example of multiple common names for the same species is *Salsola australis*, which is known as roly poly, saltwort, prickly saltwort, tumbleweed, buckbush and Russian thistle.

Our modern scientific naming system of genus and species comes from the Swede, Carl Linnaeus (1707–78), who divided flowering plants into groups depending on their flowers and fruits. Unfortunately, identifying plants by flowers and fruits is too late for most management strategies, particularly for weed control in summer. Using vegetative characteristics to identify plants helps overcome this problem and has the major benefits of cost-effective control before plants become big and moisture-stressed.

Starting point for identification

The starting point to narrow down and identify the majority of weeds (flowering plants) is to figure out whether they are grasses or grass-like (monocotyledons) or broadleaf (dicotyledons).

Grasses and grass-like plants can be identified by the following characteristics:

- they have a single seed leaf (cotyledon)
- their leaves lack a leaf stalk; each leaf consists of an upper strap-like blade and a sheathing base that encloses the stem
- the ligule (where the leaf blade joins the leaf sheath on the upper leaf surface) is either membranous or hairy
- their leaf veins are parallel with no single main vein
- their roots are fibrous
- the plants have no woody parts (herbaceous).

The major monocotyledon families are the Poaceae (grasses), Liliaceae (lilies), Cyperaceae (sedges), Orchidaceae (orchids), Iridaceae (irises) and Alliaceae (onions).

Broadleaf plants can be identified by the following characteristics:

- they have two cotyledons
- their shoot system consists of –
  - a main axis (stem)
  - leaves attached to the stem at nodes
- each leaf consists of a blade (lamina) and a leaf stalk (petiole)
- leaves have a strongly developed main vein with lateral veins (reticulate pattern)
- buds form in leaf axils and at the end of stem
- the root system consists of a primary (tap) root with lateral roots.

Characteristics of WA summer weeds

This publication groups weeds into grasses or broadleaf (no grass-like weed species are included). Within these two broad groups, the weeds are grouped by plant family, then genus and species. Their common names are given to ensure we are all discussing the same plant.

Grasses

Aristida contorta

Common names: kerosene grass, bunched kerosene grass, bunched windgrass, windgrass, silvergrass, mulga grass, sand speargrass, sand wiregrass

Can be confused with: other native grasses such as corkscrew grass (*Austrostipa* spp.)

Family: Poaceae

Key distinguishing features: annual or weak perennial grass 12 to 50 centimetres (cm) tall. Leaves with a smooth or rough sheath at the base. Ligule a fringe of hairs. Leaves 3 to 10cm long, less than one millimetre (mm) wide, threadlike. Leaf blades rolled, folded together lengthwise, or with the edges rolled inwards. Leaf surface hairless to hairy, or rough. Spikelets purple to straw coloured, 12 to 30mm long. Seeds 3 to 4mm long. Mature seed forms a cylindrical head. Seeds with three long awns.

http://ausgrass2.myspecies.info/content/aristida-contorta-1

Weed potential: rapid-growing annual to weak perennial that can dominate set-stocked pastures. Can be reasonable stockfeed when short but unpalatable as it dries. Produces sharp seeds that damage stock.

Herbicide resistance status: nil

Control: controlled grazing, registered herbicides

Location: WA, SA, Victoria, NSW, NT, Queensland

Kerosene grass (*Aristida contorta*) tussocks.
PHOTO: DENZEL MURFET

Kerosene grass (*Aristida contorta*) seed.
PHOTO: DENZEL MURFET

Kerosene grass (*Aristida contorta*) seed showing three long awns. PHOTO: DENZEL MURFET

FIGURE 1 Distribution of kerosene grass (*Aristida contorta*).
SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Avena fatua

Common names: wild oats, black oats

Can be confused with: bearded oats (*A. barbata*), Ludo wild oats (*A. ludoviciana*). Seedlings can also be confused with brome grasses. Ludo wild oats (*A. ludoviciana*) are uncommon in WA.

Family: Poaceae

Key distinguishing features: robust annual grass to 1.6 metres (m). Lemma has a minute split at the end. Large pyramid-shaped heads not leaning to one side. Paired seeds (florets) separate easily at maturity.

http://ausgrass2.myspecies.info/content/avena-fatua

Weed potential: major weed of winter cropping in southern Australia but will grow in summer with sufficient moisture and lower temperatures

Herbicide resistance status: MoA groups A, B, Z

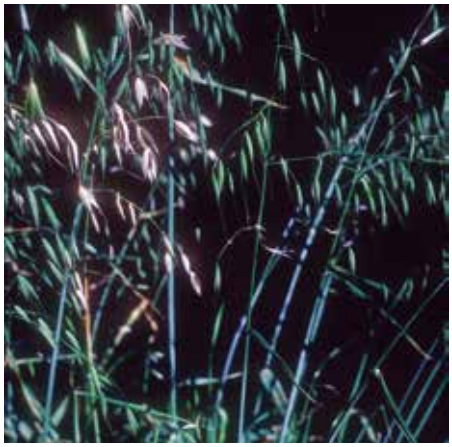
Control: crop rotation, hay cutting, green manuring, grazing, harvest seed management, registered herbicides

Location: WA, SA, Victoria, NSW, Tasmania

Wild oat seedling at two leaf stage. Note the rounded tip of first leaf. PHOTO: BRUCE WILSON

Tillering wild oat seedling. PHOTO: BRUCE WILSON

Papery ligule of wild oat. Note that there are no auricles. PHOTO: BRUCE WILSON



Wild oat seed heads. PHOTO: BRUCE WILSON

Seeds of the three main wild oat species. L to R: *A. fatua, A. barbata, A. ludoviciana*. PHOTO: GEOFF SAINTY

Chloris truncata

Common names: windmill grass

Can be confused with: *Digitaria* spp., couch (*Cynodon dactylon*)

Family: Poaceae

Key distinguishing features: native short-lived hairless tussock-forming perennial to 40cm. Flat terminal seed head with 5 to 10 horizontal radiating spikes to 20cm long. Basal leaves spreading. Leaves 2 to 5mm wide. Roots at the nodes.

http://ausgrass2.myspecies.info/content/chloris-truncata

Weed potential: windmill grass has become a weed of no-till fallows and roadsides. It is tolerant of glyphosate at most growth stages.

Herbicide resistance status: MoA group M

Control: cultivation, double-knock, controlled grazing

Location: WA, SA, Victoria, NSW, SE Queensland

Windmill grass (*Chloris truncata*) tussock and seed heads. PHOTO: JOHN HOSKING

Windmill grass (*Chloris truncata*) plants. PHOTO: ANDREW STORRIE

Windmill grass (*Chloris truncata*) seeds detaching from seed head. PHOTO: PETER ABELL/GEOFF SAINTY

FIGURE 2 Distribution of windmill grass (*Chloris truncata*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Chloris virgata

Common names: feathertop Rhodes grass, feather finger grass, feather windmill grass, feathertop chloris, hairy Rhodes grass, windmill grass, woolly-top Rhodes grass

Can be confused with: awnless barnyard grass (*Echinochloa crus-galli*) at the seedling stage

Family: Poaceae

Key distinguishing features: hairless short-lived warm-season annual or perennial grass to 1m. Florets with white hairs near the tip giving an overall feather-like appearance. Seed head consists of 7 to 19 feathery spikes held upright. Stems branched, hollow and bent at the nodes. Leaves are about 15cm long with sharp edges. There are tufts of long hairs on the leaf blade margins. Seedlings are mid-green with a flattened appearance. Ligule is a low membranous rim which splits to resemble a rim of tiny hairs. Seeds germinate in spring and plants will set viable seed within four to six weeks of germination with high temperatures and reducing soil-available moisture. It is spread by seed, which sheds readily from the head.

http://ausgrass2.myspecies.info/content/chloris-virgata

Weed potential: feathertop Rhodes grass has become a major weed of glyphosate-based fallows and roadsides due to its tolerance of glyphosate and ability to germinate on the soil surface. Can germinate and establish under winter crops in spring.

Herbicide resistance status: MoA group M

Control: cultivation, double-knock, pre-emergent registered herbicides, selective post-emergent registered herbicides, improved crop competition

Location: all mainland states

Feathertop Rhodes grass (*Chloris virgata*) seedling. PHOTO: BRUCE WILSON

Tillering feathertop Rhodes grass (*Chloris virgata*) seedling. PHOTO: BRUCE WILSON

Ligule of feathertop Rhodes grass (*Chloris virgata*). PHOTO: BRUCE WILSON

Feathertop Rhodes grass (*Chloris virgata*) seed heads at different levels of maturity. PHOTO: GEOFF SAINTY

Feathertop Rhodes grass (*Chloris virgata*) seeds . Ruler marks = 1mm. PHOTO: ANDREW STORRIE

FIGURE 3 Distribution of feathertop Rhodes grass (*Chloris virgata*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Dactyloctenium radulans

Common names: button grass, finger grass

Can be confused with: other summer grasses

Family: Poaceae

Key distinguishing features: native spreading summer annual to about 30cm high. Terminal, semi-globular seed head with 3 to 10 crowned spikes to 1.5cm long that fall in one piece. Leaves to 4mm wide, margins fringed with hairs. Spikelets with short hairs in regular rows on one side of a flattened axis. Hays off quickly in summer. Prefers lighter-textured soils and seasonally wet areas. Flowers between October and June.

http://ausgrass2.myspecies.info/content/dactyloctenium-radulans

Weed potential: a colonising species that provides reasonable sheep feed when young but can poison hungry sheep. Increases in density with heavy grazing. It is a significant weed of summer fallow and crops. Can act as a green bridge for pests and diseases for crops. Can be difficult to control with knockdown herbicides due to moisture stress.

Herbicide resistance status: nil

Control: heavy grazing, registered herbicides, cultivation

Location: all mainland states

Button grass (*Dactyloctenium radulans*) seedling. PHOTO: BRUCE WILSON

Tillering button grass (*Dactyloctenium radulans*) seedling. PHOTO: BRUCE WILSON

Button grass (*Dactyloctenium radulans*) seed heads. PHOTO: BRUCE WILSON

Close-up of button grass (*Dactyloctenium radulans*) seed heads and leaf sheath. PHOTO: GEOFF SAINTY

Button grass seeds. Ruler marks = 1mm. PHOTO: ANDREW STORRIE

FIGURE 4 Distribution of button grass (*Dactyloctenium radulans*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Digitaria ciliaris

Common names: summer grass

Can be confused with: crab grass (*D. sanguinalis*), windmill grass (*Chloris truncata*), couch (*Cynodon dactylon*)

Family: Poaceae

Key distinguishing features: ascending summer subtropical annual to 60cm high. Rarely roots at the nodes and has smooth nerves on the sterile spikelet floret with fine lines of hairs between the nerves and along the margins (compare with *D. sanguinalis*). Leaf blade to 8mm wide with a few hairs; leaf sheath has a few tubercle-based hairs; seed head purplish in colour with four to nine branches with spikelets to 3.5cm long. Flowers any time of year in warmer areas and summer in southern areas.

http://ausgrass2.myspecies.info/content/digitaria-ciliaris

Weed potential: surface-germinating annual spread by seed able to establish in any disturbed ground: woodlands, roadsides, gardens, fencelines, summer crops, summer fallow.

Herbicide resistance status: nil

Control: registered herbicides, cultivation, maintaining groundcover

Location: all states

Summer grass (*Digitaria ciliaris*) seedling.
PHOTO: BRUCE WILSON

Tillering summer grass (*Digitaria ciliaris*) seedling.
PHOTO: BRUCE WILSON

Summer grass (Digitaria ciliaris) seed head.
PHOTO: GEOFF SAINTY

FIGURE 5 Distribution of summer grass (*Digitaria ciliaris*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Digitaria sanguinalis

Common names: summer grass, crab grass, large crabgrass, hairy crab grass, crab finger grass, purple crabgrass

Can be confused with: summer grass (*D. ciliaris*), other Digitaria species.

Family: Poaceae

Key distinguishing features: spreading annual with ascending stems to 70cm high. Spikelets are attached to one side of the branch. Stems are hairy, rooting at the nodes. Leaves hairy with a membranous ligule. Ligule is 1 to 2mm long with no auricles. Like *D. ciliaris*, leaf sheaths have tubercle-based hairs. Seed head terminal with five to nine branches, with each branch about 25cm long. Fewer hairs on 'seeds' than *D. ciliaris*. Flowers in summer and autumn in southern areas.

http://ausgrass2.myspecies.info/content/digitaria-sanguinalis

Weed potential: produces a significant number of seeds with low dormancy. A weed of summer crops, pastures and summer fallow. Because it roots at nodes, one plant can occupy an area of two square metres.

Herbicide resistance status: MoA group A

Control: registered herbicides, cultivation, maintaining groundcover

Location: more southern distribution than *D. ciliaris*. Southern Queensland, NSW, Victoria, Tasmania and southern WA.

Crab grass (Digitaria sanguinalis) seedling. PHOTO: ANDREW STORRIE

Crab grass (*Digitaria sanguinalis*) showing roots forming at the nodes where it contacts the soils. PHOTO: ANDREW STORRIE

Crab grass (*Digitaria sanguinalis*) leaf sheath and seed head. PHOTO: GEOFF SAINTY

Crab grass (*Digitaria sanguinalis*) seeds. PHOTO: PETER ABELL/GEOFF SAINTY

Crab grass (*Digitaria sanguinalis*) infestation in cereal stubble. PHOTO: ANDREW STORRIE

FIGURE 6 Crab grass (*Digitaria sanguinalis*) distribution. SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Eragrostis cilianensis

Common names: stink grass, black grass

Can be confused with: *Poa* spp., other *Eragrostis* spp., *Fescue* spp.

Family: Poaceae

Key distinguishing features: tufted summer annual to 90cm high. Has a ring or cluster of glands just below the node on flowering stems. Leaf margins and the mid-nerve have pitted or wart-like glands. Panicles open or compact. Axils of inflorescence with swollen bearded glands. Leaves 4 to 5mm wide, mostly hairless with some soft hairs near ligule which is 1.5mm long. Strong pungent odour when crushed or following rain.

http://ausgrass2.myspecies.info/content/eragrostis-cilianensis

Weed potential: widespread weed of summer fallows. Generally not eaten by stock but can taint meat.

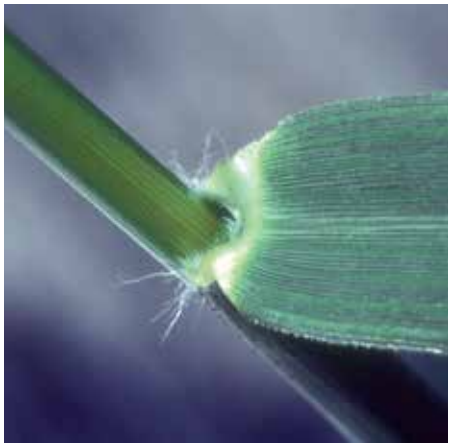
Herbicide resistance status: nil

Control: registered herbicides, cultivation

Location: all states

Stink grass (*Eragrostis cilianensis*) seedling.
PHOTO: BRUCE WILSON

Tillering stink grass (*Eragrostis cilianensis*) seedling.
PHOTO: BRUCE WILSON



Stink grass (*Eragrostis cilianensis*) ligule.
PHOTO: BRUCE WILSON

Stink grass (Eragrostis cilianensis) plants.
PHOTO: BRUCE WILSON

FIGURE 7 Distribution of stink grass (*Eragrostis cilianensis*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Panicum capillare

Common names: witch grass, tickle grass, tumbleweed, witchgrass Panic

Can be confused with: *P. hillmanii*, *P. effusum*, blown grass (*Lachnagrostis filiformis*)

Family: Poaceae

Key distinguishing features: tufted warm-season annual to 1m high. Broad leaf blades to 15mm wide. Leaf sheaths covered with tubercle-based hairs. Seed head is normally half the plant height. Seed heads break off and are dispersed by the wind. Prefers heavier-textured soils.

http://ausgrass2.myspecies.info/content/panicum-capillare

Weed potential: a weed of summer fallows in southern Australia. Seed heads build up along fencelines and roadsides. Witch grass also causes photosensitisation in sheep.

Herbicide resistance status: nil

Control: registered herbicides, cultivation

Location: all states but mainly found in southern areas

Witch grass (*Panicum capillare*) seedling. PHOTO: ANDREW STORRIE

Witch grass (*Panicum capillare*) plant. PHOTO: ANDREW STORRIE

Witch grass (*Panicum capillare*) seed head and leaf sheath. PHOTO: ANDREW STORRIE

FIGURE 8 Distribution of witch grass (*Panicum capillare*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Broadleaf weeds

Mesembryanthemum crystallinum

Common names: common ice plant, crystalline ice plant

Can be confused with: small ice plant (*M. nodiflorum*), Namibian ice plant (*M. guerichianum*), pigfaces (*Carpobrotus* spp.)

Family: Aizoaceae

Key distinguishing features: prostrate annual or biennial to 40cm high. Covered with large glistening water-filled warts 1 to 2mm wide. Stems often reddish. The leaves are thick, flat, wavy, heart-shaped, tapering to a narrow point (*Carpobrotus spp*. leaves have a triangular cross-section). Basal leaves are up to 12cm long with a short, broad, stem-clasping stalk while stem leaves are up to 4cm long. Flowers on short, stout stalks at the ends of the branches or opposite a leaf. Each flower has several rows of white petals which are up to 15mm long. Fruits are a five-celled capsule. Flowers spring to early summer.

https://bie.ala.org.au/species/http://id.biodiversity.org.au/node/apni/2889606#overview

http://www.cpbr.gov.au/cpbr/WfHC/Mesembryanthemum/index.html

Weed potential: often found on saline sites. Rarely grazed.

Herbicide resistance status: nil

Control: improve salinity status of the area, time-controlled grazing, registered herbicides

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Location: WA, SA, Victoria and NSW

Common ice plant (*Mesembryanthemum crystallinum*) seedling. PHOTO: GEOFF SAINTY

Common ice plant (*Mesembryanthemum crystallinum*) at six-leaf stage. PHOTO: GEOFF SAINTY

Flowering common ice plant (*Mesembryanthemum crystallinum*). PHOTO: GEOFF SAINTY

Figure 9 Distribution of common ice plant (*Mesembryanthemum crystallinum*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Conyza bonariensis

Common names: fleabane, flaxleaf fleabane, rough conyza, ragweed, cobblers peg (misapplied name used in the north coast of NSW)

Can be confused with: other fleabanes; note that fleabane species will hybridise giving intermediate forms

TABLE 1: Characteristics of the three main fleabane species.

Characteristic	Flaxleaf fleabane	Tall fleabane	Canadian fleabane
Mature plant height (m)	1	2	1.5
Stem branching	Unbranched below flower head	Single stem	Single stem
Inflorescence shape	Lateral branches overtopping main stem	Pyramid with lateral branches not overtopping main stem	Pyramidal
Floret colour	White to pink	Straw	Cream
Floret bracts	Densely hairy	Densely hairy	Hairless
Receptacle	Smoothly pitted	Roughly pitted	Smoothly pitted

Conyza bonariensis (cont.)

Family: Asteraceae

Key distinguishing features: erect pale grey-green warm-season annual herb to 1m high. Side branches of inflorescence often overtopping the main axis. Heads 5 to 6mm long. Bracts around heads hairy with some long hairs at the apex. Pappus is white or pink. Receptacle is smoothly pitted. Stop stems with long, spreading hairs. Leaves have short hairs facing forward plus longer spreading hairs; flower heads numerous and produced most of the year. Spread by seed.

Cotyledons: pear-shaped, apex pointed, hairless

First leaves: first and second leaves are opposite, spear-shaped, with long hairs on the upper surface and few hairs on the lower surface. Apex is pointed and the leaf margin is slightly toothed. Subsequent leaves emerge alternately.

IWM manual – https://grdc.com.au/__data/assets/pdf_file/0029/47873/iwmm6-pdf.pdf.pdf page 305

WEEDpak – https://www.cottoninfo.com.au/sites/default/files/documents/WEEDpak-optimised.pdf section A3.6

Weed potential: Flaxleaf fleabane has become a major weed of cropping, chemical fallow, pastures, roadsides, vineyards and tree crops with the widespread adoption of chemical fallow and no-till. It is a surface germinator and is favoured by the lack of disturbance in no-till cropping. It is also tolerant of glyphosate once the rosette is larger than 5cm in diameter. The effectiveness of herbicides on flaxleaf fleabane declines when the ambient temperature is greater than 30°C.

Herbicide resistance status: MoA groups L, M

Control: cultivation, registered herbicides, double-knockdown, spot spraying, hoeing

Location: all states

Flaxleaf fleabane (*Conyza bonariensis*) seedling. PHOTO: BRUCE WILSON

Flaxleaf fleabane (*Conyza bonariensis*) rosette. PHOTO: BRUCE WILSON

Flowering flaxleaf fleabane (*Conyza bonariensis*). PHOTO: BRUCE WILSON

Comparison of flowers and receptacles of tall fleabane (*C. sumatrensis*) (L) and flaxleaf fleabane (*C. bonariensis*) (R). PHOTO: JOHN HOSKING

FIGURE 10 Distribution of flaxleaf fleabane (*Conyza bonariensis*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Oncosiphon piluliferum (syn. *Matricaria matricarioides, Pentzia globifera*)

Common names: globe chamomile, stinknet, matricaria

Can be confused with: Calomba daisy (*O. suffruticosum*)

Family: Asteraceae

Key distinguishing features: erect annual cool-season herb up to 80cm high. Plants with a strong unpleasant odour. Leaves alternate, deeply lobed with a pointed apex. Stem with longitudinal grooves, with many branches. Stem and leaves have fine hairs and minute glands. Yellow globe-shaped inflorescences consisting of yellow disc florets.

Cotyledons: oval, apex rounded, hairless

First leaves: spear-shaped, apex pointed, long hairs

http://www.efloras.org/object_page.aspx?object_id=57418&flora_id=1

Weed potential: a weed of fallows and poorly managed pastures. Will grow in summer with sufficient moisture and mild temperatures.

Herbicide resistance status: nil

Control: registered herbicides, cultivation, time-controlled grazing

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Location: WA (common), Victoria, NSW

Matricaria (*Oncosiphon piluliferum*) seedlings showing cotyledons and first leaves. PHOTO: ALEX DOUGLAS

Matricaria (*Oncosiphon piluliferum*) before flowering. PHOTO: ANDREW STORRIE

Matricaria (*Oncosiphon piluliferum*) starting to flower. PHOTO: GEOFF SAINTY

Matricaria (*Oncosiphon piluliferum*) flowers and leaves. PHOTO: ANDREW STORRIE

FIGURE 11 Matricaria (*Oncosiphon piluliferum*) distribution. SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Oncosiphon suffruticosum (syn. *Pentzia suffruticosa*)

Common names: Calomba daisy, matricaria, yellow top

Can be confused with: globe chamomile (*O. piluliferum*)

Family: Asteraceae

Key distinguishing features: erect cool-season annual aromatic herb to 60cm high that can grow into summer when conditions are favourable. Grey-green leaves are divided feather-like to the midrib, covered with short, soft glandular and non-glandular hairs. Bracts around heads in two rows. Flat-topped inflorescences. All florets are yellow and tubular. 'Seeds' are asymmetrically wedge-shaped. Receptacle is conical. Stems are erect and not usually branched below the inflorescence. Leaves are alternate 2 to 4cm long and 1 to 2cm wide. Heads about 0.5cm wide in dense, branched inflorescences.

https://bie.ala.org.au/species/http://id.biodiversity.org.au/node/apni/2889606#overview

Weed potential: a significant weed of fallows, crops and pastures in certain districts. Not eaten by stock. A declared weed in some states.

Herbicide resistance status: MoA group B

Control: herbicides, cultivation, time-controlled grazing

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Trials – WA http://www.rcsn.net.au/uploads/5/4/2/8/54288593/adouglas-all.pdf

Location: WA, SA

FIGURE 12 Calomba daisy (*Oncosiphon suffruticosum*) distribution. SOURCE: ATLAS OF LIVING AUSTRALIA

Sonchus oleraceus

Common names: common sowthistle, milk thistle, guineapig weed

Can be confused with: prickly sowthistle (*S. asper*), false sowthistle (*Reichardia tingitana*)

Family: Asteraceae

Key distinguishing features: annual herb to 1.2m high. Milky sap. Hollow stems. Leaves thin and soft with margins lobed to toothed. Basal leaves lanceolate and not stem-clasping, while stem leaves have pointed stem-clasping basal lobes. Inflorescence made up of flat-topped panicles. Flowers yellow. Seeds are 2.5 to 4mm long, ovoid in shape, compressed and transversely wrinkled. Margins are narrow without a beak. *S. asper* by comparison has a winged margin. Flowers all year and will establish any time of the year as long as sufficient soil moisture available.

Cotyledons: oval, apex rounded, hairless

First leaves: oval, apex rounded, margins slightly toothed and with a few spines and sparse hairs on the upper surface.

IWM manual – https://grdc.com.au/__data/assets/pdf_file/0029/47873/iwmm6-pdf.pdf.pdf page 299

Weed potential: another surface-germinating weed that has been favoured by the spread of no-till cropping. It is now a major weed of both winter and summer crops and fallows. It is also found on fencelines, roadsides and waste places. It acts as an alternate host for many crop diseases and insect pests. Not a pasture weed as it is readily eaten by stock.

Herbicide resistance status: MoA groups B, I, M

Control: registered herbicides, cultivation, improved crop competition, grazing crop residues

GRDC IWM hub – https://grdc.com.au/resources-and-publications/iwmhub

Location: widespread across all states

Sowthistle (*Sonchus oleraceus*) seedling showing cotyledons. PHOTO: BRUCE WILSON

Sowthistle (*Sonchus oleraceus*) rosette. PHOTO: BRUCE WILSON

Sowthistle (*Sonchus oleraceus*) flowers. PHOTO: BRUCE WILSON

FIGURE 13 Distribution of sowthistle (*Sonchus oleraceus*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Brassica tournefortii

Common names: wild turnip, Mediterranean turnip, long fruited turnip, Asian mustard, pale cabbage, African mustard, Sahara mustard

Can be confused with: wild radish and turnip weed

Family: Brassicaceae

Key distinguishing features: annual cool-season forb with an erect, branching, green to violet stem to 60cm high which is bristly near the base. Leaves are bristly, up to 14cm long and deeply lobed with a large terminal lobe. Ends of lobes pointing towards the leaf base. Most leaves are on a short stalk. The first leaf terminates in a blunt, rounded lobe. Flowers are four-petalled, pale yellow, up to 8mm long, fading to whitish. Compared to other brassicas, flowers are sparse. Fruit is a two-celled cylindrical pod to 70mm long and up to 3mm wide, convex on both sides with a slender one-seeded conical beak to 10mm long. Pods are spreading. Seeds are globular, red-brown about 2mm wide. Flowers in winter and spring.

Cotyledons: kidney-shaped, long petiole

First leaves: club-shaped, hairy petiole and leaf, margin lobed to deeply lobed

Flowers and pod – http://saseedbank.com.au/species_information.php?rid=771

Weed potential: a major cool-season weed of cropping and pastures across Australia particularly on lighter-textured soils; however, it will grow in summer with sufficient soil water and milder temperatures. It is well adapted to low rainfall conditions and poses a threat to native vegetation in marginal rainfall areas.

Herbicide resistance status: MoA group B

Control: registered herbicides, cultivation, time-controlled grazing

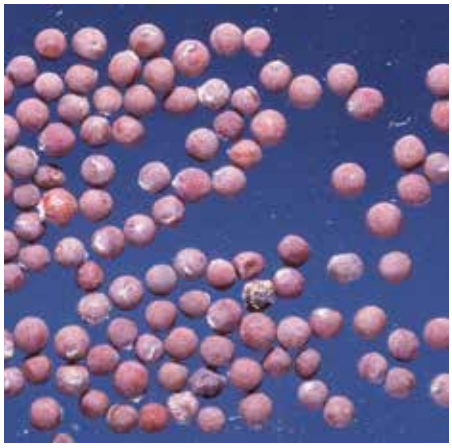
Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Location: widespread across all states

Wild turnip (*Brassica tournefortii*) seedling showing kidney-shaped cotyledons. PHOTO: BRUCE WILSON

Wild turnip (*Brassica tournefortii*) plant flowering. PHOTO: BRUCE WILSON

Close-up of wild turnip (*Brassica tournefortii*) pod and leaf. PHOTO: GEOFF SAINTY



Wild turnip (*Brassica tournefortii*) seeds. PHOTO: PETER ABELL/GEOFF SAINTY

FIGURE 14 Distribution of wild turnip (*Brassica tournefortii*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Raphanus raphanistrum

Common names: wild radish, jointed charlock

Can be confused with: wild turnip (*Brassica tournefortii*), common radish (*R. sativus*)

Family: Brassicaceae

Key distinguishing features: erect annual or biennial forb to 1.5m high. Leaves variable with bristle-like hairs; basal leaves lobed, to 40cm long on a stalk. Stem leaves often undivided. Flowers with four petals to 24mm long. Flower colour can vary (yellow, white, mauve), often with prominent purple veins. Fruit is a two-celled cylindrical pod to 9cm long and 6mm wide borne on erect, spreading stalks. Constrictions between the seeds. The beak is seedless to 12mm long. When ripe, the pod breaks into ribbed one-seeded globular sections. Seeds almost globular to 4mm. Will germinate and flower most of the year if soil moisture available. Prefers lighter-textured acid to neutral pH soils.

Cotyledons: heart-shaped, hairless

First leaves: oval, apex rounded, margin toothed and sometimes lobed with prominent veins and short stiff hairs

IWM manual – https://grdc.com.au/__data/assets/pdf_file/0029/47873/iwmm6-pdf.pdf.pdf page 323

Weed potential: while a major broadleaf weed of winter cropping in southern Australia, it will continue to grow into summer with sufficient soil moisture and moderate temperatures. Wild radish will also germinate in summer under these conditions. Pods break into segments causing contamination of winter cereals. Green pods in stored grain reduces viability of that grain. Rarely eaten by stock.

Herbicide resistance status: MoA groups B, C, F, I, M; also multiple-resistant populations – B + F, B + F + I, B + I, B + F + M + I

Control: registered herbicides, cultivation, green manure, inversion ploughing, winter fallow, time-controlled grazing

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Location: all Australian states and territories

Wild radish (*Raphanus raphanistrum*) seedling. Note the heart-shaped cotyledons. PHOTO: BRUCE WILSON

Wild radish (*Raphanus raphanistrum*) rosette. PHOTO: BRUCE WILSON

Flowering wild radish (*Raphanus raphanistrum*). PHOTO: BRUCE WILSON

Wild radish (*Raphanus raphanistrum*) flower showing prominent veins. PHOTO: BRUCE WILSON

Wild radish (*Raphanus raphanistrum*) seed enclosed in pod. PHOTO: ANDREW STORRIE

FIGURE 15 Distribution of wild radish (*Raphanus raphanistrum*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Heliotropium europaeum

Common names: common heliotrope, caterpillar weed, potato weed

Can be confused with: spreading heliotrope (*H. supinum*)

Family: Boraginaceae

Key distinguishing features: summer-growing, hairy annual forb to 30cm high covered in closely appressed hairs. Leaves grey-green, alternate, oval-shaped, to 5cm long with a leaf stalk. Flowers white, tubular and as long as the calyx with five equal lobes, in two rows on a curled flower head that straightens as the flowers develop. Fruit are rough and wrinkled nutlets that are sometimes hairy. Flowers late summer to autumn.

Cotyledons: round, apex rounded, fine hairs on both surfaces

First leaves: oval, apex tapering, small hairs on both surfaces with veins becoming prominent. Leaves paired.

Weed potential: a major summer fallow weed in southern Australia on a range of soil types. Will flower within a few weeks of germination. Reluctantly eaten by stock causing subsequent liver damage.

http://weeds.dpi.nsw.gov.au/Weeds/Details/19

https://www.agric.wa.gov.au/declared-plants/heliotrope-pest

Herbicide resistance status: nil

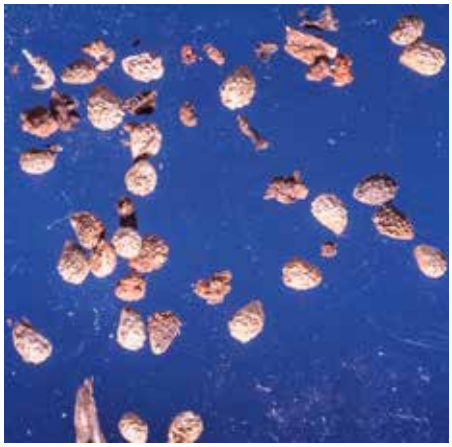
Control: registered herbicides, cultivation

Location: WA, SA, Victoria and NSW

Common heliotrope (*Heliotropium europaeum*) seedlings. PHOTO: ANDREW STORRIE

Common heliotrope (*Heliotropium europaeum*) flowering due to stress. PHOTO: GEOFF SAINTY

Common heliotrope (*Heliotropium europaeum*) flowers. PHOTO: GEOFF SAINTY



Common heliotrope (*Heliotropium europaeum*) seeds. PHOTO: PETER ABELL/GEOFF SAINTY

FIGURE 16 Distribution of common heliotrope (*Heliotropium europaeum*).
SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Dysphania pumilio (syn. *Chenopodium pumilio*)

Common names: mintweed, small crumbweed, Boggabri, rough-leaved goosefoot, clammy goosefoot

Can be confused with: other goosefoot species

Family: Chenopodiaceae

Key distinguishing features: strongly aromatic native annual or short-lived perennial forb with a covering of short hairs. Plant is prostrate or ascending, rarely more than 25cm high. Leaves pale-green, to 2cm long on slender stalks with margins toothed or lobed. Flowers very small, crowded in small clusters in the leaf axils. Fruit is globe-shaped, downy to 1.5mm wide. Seed is reddish-black and shiny. Flowers spring and summer.

Cotyledons: oval, apex pointed, sparse small hairs, reddish on the lower side

First leaves: diamond-shaped with pointed apex, toothed margin and small hairs

http://keys.lucidcentral.org/keys/v3/scotia/key/Plants%20and%20Fungi%20of%20south%20western%20NSW/Media/Html/Dysphania_pumilio.htm

seeds – http://saseedbank.com.au/species_information.php?rid=1543

Weed potential: a widespread summer fallow weed on lighter-textured soils. Not grazed due to its strong smell.

Herbicide resistance status: nil

Control: registered herbicides, cultivation, time-controlled grazing

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Location: all states and territories.

Mintweed (*Dysphania pumilio*) seedling showing cotyledons. PHOTO: BRUCE WILSON

Mintweed (*Dysphania pumilio*) seedling. PHOTO: BRUCE WILSON

Mintweed (*Dysphania pumilio*) flowering. PHOTO: BRUCE WILSON

FIGURE 17 Distribution of mintweed (*Dysphania pumilio*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Salsola australis (syn. S. tragus, S. kali)

Common names: prickly saltwort, roly poly, saltwort, tumbleweed, buckbush, Russian thistle

Can be confused with: kochia (*Bassia scoparia*), black roly-poly (*Sclerolaena muricata*)

Family: Chenopodiaceae

Key distinguishing features: erect, bushy warm-season native herb to at least 60cm high. Leaves are narrow-cylindrical, tipped with spines, alternate, to 40mm long and 6mm wide. Flowers stalkless in upper leaf axils, sometimes crowded towards the end of branches, subtended by a pair of the leaf-like bracts. Fruit is to 7mm wide with five fan-like wings, or three longer than the other two. Fruit usually remaining attached. Flowers late spring to autumn. Whole plant breaks off at ground level when mature, becoming a tumbleweed.

Fruits and flowers – http://saseedbank.com.au/species_information.php?rid=3881

Weed potential: a weed of crops, fallow and overgrazed pastures and rangelands. Plants are grazed when young. Plants have an extensive root system allowing it to become a successful coloniser of scalded or eroded soils, particularly in saline areas. Tumbling plants can accumulate along fencelines and also block farm machinery.

Herbicide resistance status: nil

Control: registered herbicides, cultivation, time-controlled grazing when very young, burn crop residue

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

DPIRD WA Factsheet – https://weedsmart.org.au/wp-content/uploads/2017/07/Factsheet-Roly-poly.pdf

Summer fallow weed management – https://grdc.com.au/resources-and-publications/all-publications/publications/2014/05/grdc-manual-summerfallowweedmanagement

Location: all states except Tasmania

Prickly saltwort (*Salsola australis*) seedling. PHOTO: BRUCE WILSON

Prickly saltwort (*Salsola australis*) seedling. PHOTO: BRUCE WILSON

Prickly saltwort (*Salsola australis*) fruits. PHOTO: GEOFF SAINTY

Dead prickly saltwort (*Salsola australis*) plants along fence. PHOTO: ANDREW STORRIE

FIGURE 18 Distribution of prickly saltwort (*Salsola australis*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Citrullus lanatus

Common names: Afghan melon, camel melon, jam melon, wild melon, bitter melon, pie melon, bastard melon

Can be confused with: other melons in the vegetative stage

Family: Cucurbitaceae

Key distinguishing features: warm-season annual vine with hairy stems to 3m long. Stems covered in soft hairs and woolly new growth. Leaves alternate, to 8cm long, deeply lobed into three to five round, opposite lobes with the middle lobe longest. The lower surface covered in short hairs and rough, while the upper surface hairless or a few hairs. Flowers with five yellow petals to 10mm long, hairy to densely woolly on single stalks in the leaf axils. Flowers are either male or female. Fruit is a smooth and hairless melon of variable shape to 15cm long, mottled green with patches of white. Contains numerous flattened seeds to 10mm long and 6mm wide that mature brown with black stripes.

Cotyledons: oval, indented apex, veined, hairless

First leaves: round with rounded apex and indented base. Margin toothed and lobed, veined and hairless on upper surface.

https://keyserver.lucidcentral.org/weeds/data/media/Html/citrullus_lanatus.htm

https://www.sciencedirect.com/science/article/pii/S0261219417300613

https://www.agric.wa.gov.au/postharvest/summer-weeds?page=0%2C2

Weed potential: a significant weed of summer fallow and summer crops using stored soil moisture and nutrients. Vines tangle around the tines of machinery. Rarely eaten by stock.

Herbicide resistance status: nil

Control: registered herbicides, cultivation

Location: all states except Tasmania

Afghan melon (*Citrullus lanatus*) seedling showing cotyledons. PHOTO: BRUCE WILSON

Afghan melon (*Citrullus lanatus*) seedling. PHOTO: BRUCE WILSON

Afghan melon (*Citrullus lanatus*) flower and fruit. PHOTO: GEOFF SAINTY

Afghan melon (*Citrullus lanatus*) seeds. PHOTO: ANDREW STORRIE

FIGURE 19 Distribution of Afghan melon (*Citrullus lanatus*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Cucumis myriocarpus

Common names: prickly paddy melon, gooseberry cucumber, paddy melon

Can be confused with: camel melon when small

Family: Cucurbitaceae

Key distinguishing features: annual prostrate vine with slender, rough stems to 2m. Leaves alternate, to 6cm long, some hairs on upper surface but a hairy under surface. Leaves three to five-lobed. Flowers yellow, 6mm across, borne in leaf axils. Male flowers in clusters of two to four on short stalks while female flowers either single or in pairs. Fruit is globular, up to 25mm diameter and covered in long soft bristles, beginning with dark and light green stripes turning yellow as they mature. Seeds are pale yellow to 4mm long. Flowering in summer to autumn.

https://keyserver.lucidcentral.org/weeds/data/media/Html/cucumis_myriocarpus.htm

Seeds and fruit – http://saseedbank.com.au/species_information.php?rid=1291

Weed potential: significant weed of summer fallow, disturbed areas, roadsides, stockyards. Grows on a range of soil types but usually on lighter-textured soils. Vines block tined implements.

Herbicide resistance status: nil

Control: registered herbicides, cultivation

Location: all states

Prickly paddy melon (*Cucumis myriocarpus*) seedlings. PHOTO: ANDREW STORRIE

Prickly paddy melon (*Cucumis myriocarpus*) leaves and fruit. PHOTO: ANDREW STORRIE

FIGURE 20 Distribution of prickly paddy melon (*Cucumis myriocarpus*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Malva parviflora

Common names: small-flowered mallow, marshmallow, mallow

Can be confused with: red-flowered mallow (*Modiola caroliniana*), blue crowsfoot (*Erodium crinitum*) as a seedling

Family: Malvaceae

Key distinguishing features: erect or spreading annual herb to 1m high with leaves alternate, wrinkled and round with a notched base. Deep indentations in the leaves form lobes. Upper leaf surface has a few simple hairs while the lower surface has some star-shaped and forked hairs. Leaf stalk is up to 27cm long. Flowers are white to pink and hibiscus-like in clusters of two to four in the leaf axil, 5mm long. Fruit breaks into 8 to 12 wedge-shaped fruitlets which are 2.5mm long and brown when ripe.

Cotyledons: reverse heart-shaped to about 10mm long and 7mm wide and on long purple stalks

First leaves: rounded with a notched base, slightly lobed and rounded teeth. Later leaves have more pronounced lobes and wrinkling.

http://www.iewf.org/weedid/Malva_parviflora.htm

Weed potential: a weed of both summer and winter crops. A major weed of fencelines, pastures, stockyards, around buildings, disturbed areas and gardens. Seed germination is stimulated by cultivation. Spread by seed. Eaten by stock that help spread the seed.

Herbicide resistance status: nil

Control: registered herbicides, cultivation, time-controlled grazing

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Location: widespread and common across Australia except in more tropical areas

Small-flowered mallow (*Malva parviflora*) showing heart-shaped cotyledons. PHOTO: BRUCE WILSON

Small-flowered mallow (*Malva parviflora*) seedling. PHOTO: BRUCE WILSON

Small-flowered mallow (*Malva parviflora*) showing flowers and fruits. PHOTO: GEOFF SAINTY

Small-flowered mallow (*Malva parviflora*) fruits and 'seeds'. PHOTO: GEOFF SAINTY

FIGURE 21 Small-flowered mallow (*Malva parviflora*) distribution. SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Boerhavia coccinea

Common name: tar vine

Can be confused with: *B. schomburgkiana*, *B. dominii*

Family: Nyctaginaceae

Key distinguishing features: a variable perennial prostrate native herb with outer stems growing upwards. Leaves are in pairs and are different sizes, lance-shaped to oval, to 4cm long and densely glandular hairy on both surfaces, with a leaf stalk to 3cm long. Stems hairy with long non-glandular hairs and a few short glandular hairs. Inflorescence is 2 to 10-flowered. Flowers are small, pink, mauve or white on a stalk to 1cm long. Flowers have three stamens – compare with *B. schomburgkiana* (one stamen) and *B. dominii* (two to four stamens). Fruit is elongated, to 4mm long, with five ribs. Flowers late spring to autumn.

Weed potential: a weed of summer fallows not easily controlled with herbicides

Herbicide resistance status: nil

Control: registered herbicides, cultivation, time-controlled grazing

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Location: northern WA, NT, Queensland, NSW, Victoria, and SA

Tarvine (*Boerhavia coccinea*) seedling. PHOTO: BRUCE WILSON

Tarvine (*Boerhavia coccinea*) plant. PHOTO: BRUCE WILSON

Tarvine plant (*Boerhavia coccinea*) showing flowers and fruits. PHOTO: ANDREW STORRIE

FIGURE 22 Distribution of tarvine (*Boerhavia coccinea*). SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Limonium lobatum

Common names: statice, winged sea lavender, winged sea-lavender

Can be confused with: native sea lavender (*L. australe*)

Family: Plumbaginaceae

Key distinguishing features: annual winter-growing, drought-tolerant herb to 1m high. Leaves to 10cm long and 4cm wide with five to seven lobes in a basal rosette. Flowering stems have three wings to 8mm wide. Each wing ends in a stiff triangular globe. Flowers are pale blue to whitish in dense spikes.

Cotyledons: spear-shaped with a rounded apex and hairless

First leaves: opposite, oval, hairy with lobed margins, wavy

https://keyserver.lucidcentral.org/weeds/data/media/Html/limonium_lobatum.htm

Weed potential: originally a garden escapee. A weed of pastures and natural areas. Will invade undisturbed native vegetation. Spreading in drier areas. Tolerant of glyphosate and group I herbicides.

Herbicide resistance status: nil

Control: cultivation, time-controlled grazing, chipping

Control trial – https://www.farmtrials.com.au/trial/17658

Grazing management – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

Location: drier areas of south-western WA, SA, western NSW and the Victorian Mallee

Statice (*Limonium lobatum*) seedling.
PHOTO: ALEX DOUGLAS

Statice (*Limonium lobatum*) rosette in summer.
PHOTO: ALEX DOUGLAS

Statice (*Limonium lobatum*) flowering.
PHOTO: GEOFF SAINTY

Statice (*Limonium lobatum*) flower heads.
PHOTO: GEOFF SAINTY

FIGURE 23 Distribution of statice (*Limonium lobatum*).
SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Tribulus terrestris

Common names: caltrop, catheads, puncture vine, bullhead, goathead

Can be confused with: *Tribulus minutus*, *Tribulus micrococcus*

Family: Zygophyllaceae

Key distinguishing features: prostrate, warm-season, much-branched annual to perennial herb with stems to 2m long extending from a stout taproot. Leaves with four to eight pairs of leaflets, each to about 1cm long. The upper surface is dark green and often with hairy leaf edges. The lower surface is pale and hairy. Flowers are yellow, five-petalled, found singly in leaf axils. Flowers smaller than those of *T. micrococcus*. Fruit is a woody burr comprising five hairy segments (caltrop), each with two larger outward-pointing spines and two smaller downward-pointing spines. Each segment contains up to five yellowish-coloured seeds about 2mm long.

Cotyledons: narrow oval with a flattened tip and hairless

First leaves: first true leaf consists of two pairs of elliptic leaflets which are dark green, shiny with marginal hairs. Second true leaf has three pairs of leaflets.

Flowers and fruits – http://saseedbank.com.au/species_information.php?rid=4552

Weed potential: major widespread weed of cropping, horticulture, roads, pastures and around habitation. Can set viable seed within four weeks of germinating, and will have multiple germinations over summer. Drought tolerant once established. A major contaminant in dried fruit production. Easily spread by seeds attaching to livestock and rubber tires. Can cause photosensitisation, staggers and nitrate poisoning of sheep. Also called horny goat weed and considered an aphrodisiac in some circles.

Herbicide resistance status: nil

Control: registered herbicides, cultivation, rotation, fallow, quarantine

WEEDpak – https://www.cottoninfo.com.au/sites/default/files/documents/WEEDpak-optimised.pdf section A3.8

Location: all states, widespread and common

Caltrop *(Tribulus terrestris*) seedlings showing cotyledons. PHOTO: GEOFF SAINTY

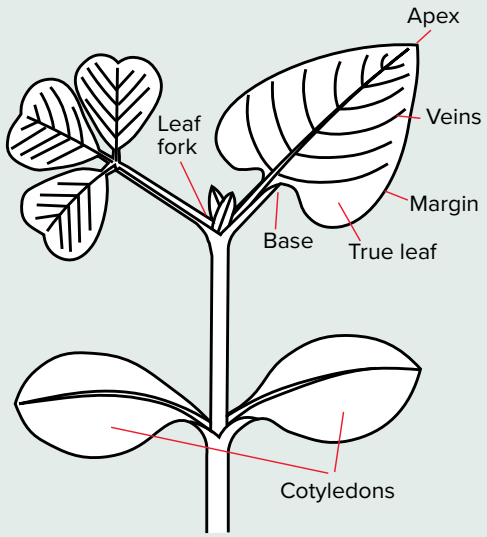
Caltrop (*Tribulus terrestris*) fruit and flowers. PHOTO: JOHN HOSKING

Larger-flowered caltrop (*Tribulus terrestris*). PHOTO: JOHN HOSKING

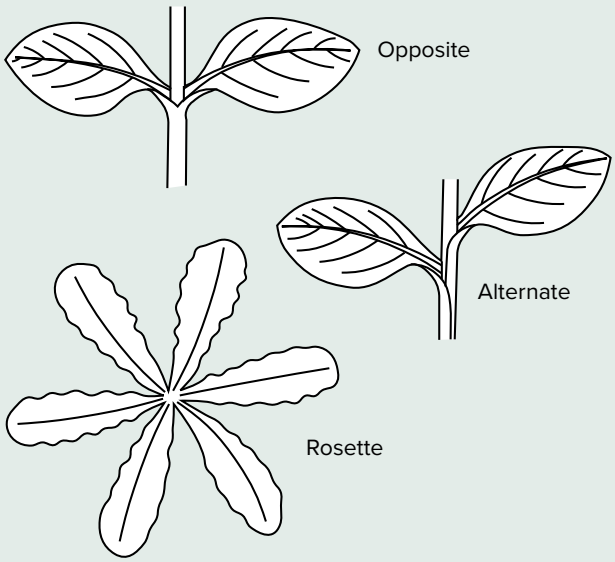
FIGURE 24 Distribution of caltrop (*Tribulus terrestris*) in Australia. SOURCE: AUSTRALASIAN VIRTUAL HERBARIUM

Plant parts

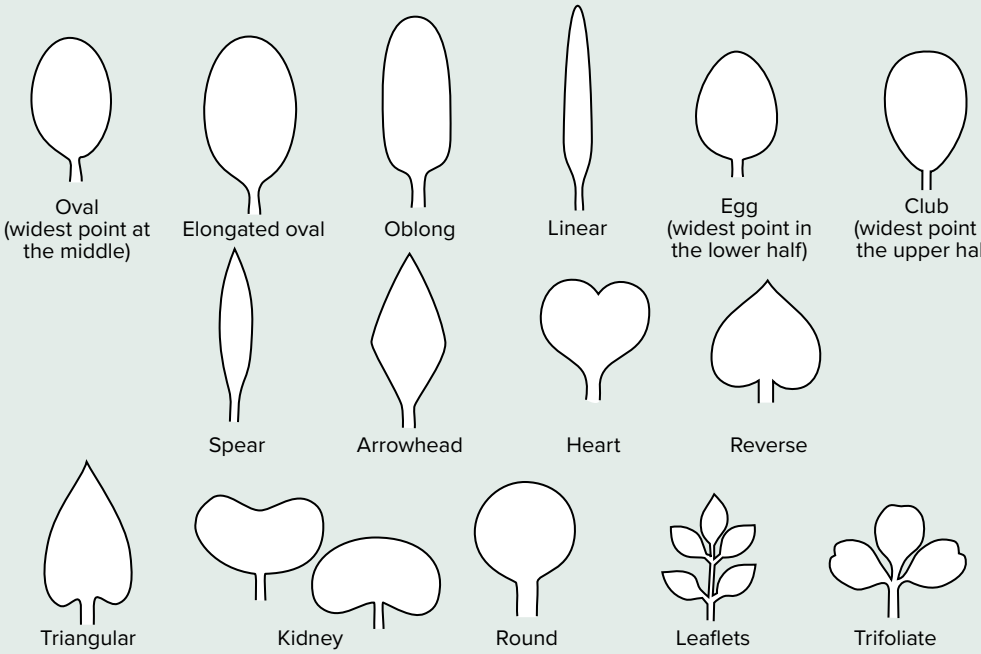
PLANT PARTS OF A BROADLEAF WEED

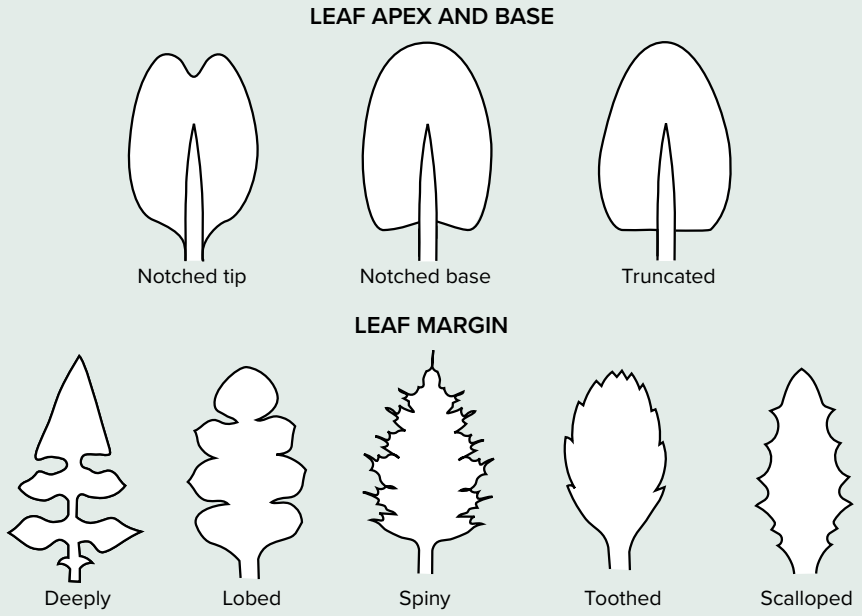


LEAF ARRANGEMENTS

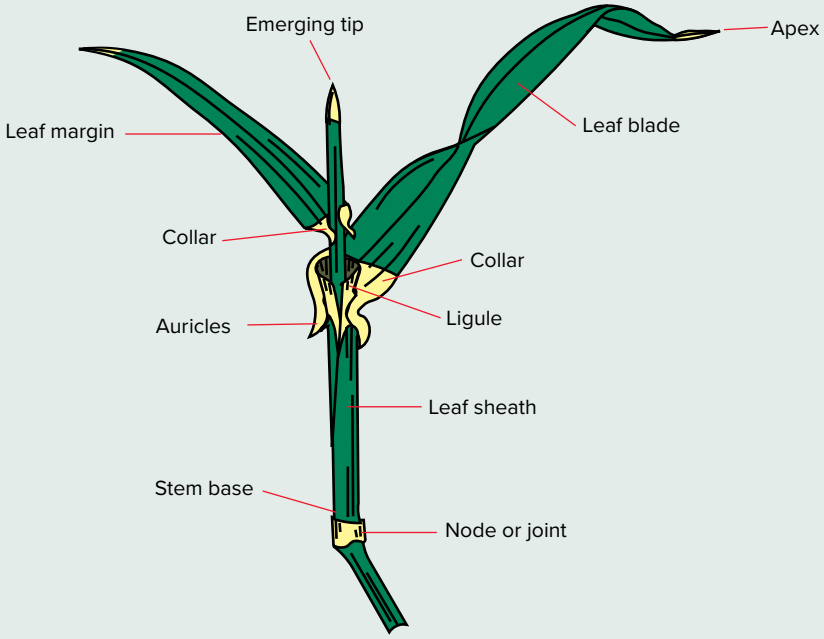


LEAF SHAPES





PLANT PARTS OF A GRASS WEED



Glossary of terms

achene – a small, dry, one-seeded fruit that does not open to release the seed; for example, sunflower seed

anther – the top of each part of a male flower that contains the pollen

appressed – when two parts of the plant are pressed against one another but not joined

ascending – curving or bending upwards into a more or less erect position

auricle – ear-like projection from the base of a leaf or petal; most commonly referred to in describing grasses where the auricles are at the base of the leaf blade where it joins the sheath

awn – a bristle-like appendage

axil – the upper angle between the leaf and the stem

axillary cluster – found between the leaf and stem

barb – a short, rigid, often hooked hair that is usually bent backwards

basal – found close to the ground and/or roots

berry – a few to many-seeded fleshy fruit not opening to release the seeds

biennial – living for two years (two summers or two winters)

bipinnate – leaf comprising a central stem with branchlets carrying the leaflets

bract – a leaf-like structure or scale below the flower or flower head

bulb – a short thick rootstock in which the bud or buds are covered by leaf scales, such as in an onion

bulbil – a small bulb that develops from an aerial bud; can form in the angle between the leaf and stem, or in place of flowers; for example, *Allium vineale*

burr – a rough, barbed, spiny or prickly structure enclosing a seed or seeds, developed from the seed, fruit or associated flower parts, and acting as a dispersal unit

calyx – the outer whorl of the flower when both sepals and petals are present; consisting of a number of sepals which may be separated or united

capsule – a dry fruit consisting of two or more united fruitlets, usually splitting into pieces called valves, or opening at the tip by teeth or pores

carpel – a cell of an ovary

clasping – when the base of a leaf or a leaf stalk is folded around the stem

coleoptile – the protective sheath around the seedling shoot in grasses; normally the first part of the grass seedling to emerge from the soil

compound – composed of several parts; for example, a leaf consisting of several leaflets or a flower head

cordate – heart-shaped in outline with the broad part at the base

cotyledon – the leaf-forming structures in the seed; monocotyledon plants have one while dicotyledons have two

corm – a short, swollen underground stem formed annually below a flowering stem and protected by dry surrounding leaf bases

corolla – the petals of a flower as a group, which may be separate or joined together

corymb – a raceme-like flower head in which the branches rise at different levels on the flower stem but the flowers are all born at the same level

cuneate – wedged-shaped with the broadest part at the tip

cyathium – the characteristic inflorescence of the spurges, resembling a single flower; it consists of a cup-shaped involucre of fused bracts enclosing several greatly reduced male flowers and a single female flower

cylindrical – shaped like a cylinder

decumbent – prostrate stems or branches with the tips turning upwards

depressed – flattened from above or endwise

dicotyledon (dicot) – a plant that has two cotyledons (seed leaves)

drupe – a stone fruit with a single, hard-coated seed encased in a fleshy pulp or leathery skin

ellipsoid – a solid body that is elliptical in outline

elliptical – an elongated rounded outline that is broadest across the middle and narrowed to both ends

entire – undivided, not toothed or lobed

floret – an individual flower in a flower head, or the flower of grass together with the palea and lemma

forb – a herb other than a grass

glabrous – free from hairs, smooth

gland – an embedded or projecting, often wart-like structure, usually secreting a fluid

globular – solid spherical or rounded

glume(s) – the bract(s) enclosing the flowers of grasses and sedges

head – an inflorescence with stalkless flowers (florets) densely clustered on the top of a common stalk

herb – a plant whose stems do not become hard and woody with dry bark

herbaceous – lacking woody tissue

hirsute – hairy

hoary – covered with greyish or whitish hairs or scales

husk – the dry outer covering of seeds; can be used to describe the glumes of grasses

inflorescence – a group of flowers borne on a single or branched stem

internode – the space between two nodes on a stem

involucre – the ring or rings of bracts surrounding a flower head or flower

lanceolate – tapering at each end but broadest in the lower part

latex – milky and often sticky sap

lax – loose

leaflet – part of the leaf blade that is separated from other similar parts; for example, clover leaves consist of three leaflets

lemma – the lower of two bracts enclosing the individual grass flower and later the seed

ligulate – strap-shaped

ligule (1) – the petal-like corolla of the outer florets in the heads of some daisies (Asteraceae)

ligule (2) – structure found at the junction of the leaf blade and sheath of a grass; can be a membrane or a fringe of hairs, and often associated with auricles

linear – narrow and straight-sided

lobe – a rounded projecting part of the leaf, petal or sepal

lyrate – a lobed leaf with the end segments longer and larger than the lower segments

mericarp – a one-seeded portion into which a shizocarp (dry fruit) splits at maturity; for example, fruits of the family Malvaceae are shizocarps

midvein – central vein of the leaf

node – joint of a stem from which a leaf or bract arises

nut – a dry fruit containing one seed and not opening when ripe

nutlet – a small, dry, non-splitting fruit containing a single seed

oblong – longer than broad, with the long sides parallel for most of their length and the ends rounded

opposite – arising from the same level but on opposite sides of the stem or branch

ovate – egg-shaped in outline, attached at the broader end

palea – the upper of two bracts enclosing the flower of the grass and later the seed

panicle – a much-branched flower head

pappus – the part of an individual floret that surrounds the base of the corolla tube in flower heads of the plant family Asteraceae; the feathery attachment to seeds that helps them move by the wind

pendulous – drooping

perianth – non-reproductive part of the flower; the structure that forms an envelope surrounding the sexual organs, consisting of the calyx (sepals) and the corolla (petals)

persistent – remaining attached, often at maturity

petal – a section of the corolla that makes up the conspicuous part of a flower and tends to surround the reproductive parts

peduncle – the stalk bearing a flower or fruit, or the main stalk of an inflorescence

pod – fruit characteristic of plants in the families Fabaceae and Brassicaceae, splitting open when mature

prostrate – lying close to or against the ground

pubescent – covered with short soft hair; downy

raceme – an unbranched flower head bearing stalk flowers and with the youngest flowers at the tip

rachis – stem of a plant bearing leaves or flower stalks at short intervals

receptacle – the thickened part of the stem from which the flower organs grow; for example, the head of the sunflower

reflexed – curving downwards

rhizome – an underground stem

rhomboid – diamond-shaped in outline

rosette – cluster of leaves at the base of the plant, often lying flat against the ground

scale – membranous reduced leaf or minute thin structure

sepals – green segments forming the outer of the two whorls of leaf-like structures on the flower; the other whorl is the petals

sheath – an entire or longitudinally split tubular structure formed by the base of leaf and encircling the stem

shizocarp – a dry fruit that splits into single-seeded parts when ripe

spathulate – spoon-shaped in outline

spike – an unbranched flower head bearing stalkless flowers along the axis

stamen – the male organ of a flower, consisting of its pollen-producing anther and filament

stigma – the female part of the flower that traps pollen; sits on top of the style

stipule – a membranous or leafy outgrowth, hairs of which occur at the base of the stalk of some leaves on either side of the point of attachment to the stem; common in the family Polygonaceae

stolon – a horizontal above-ground stem or runner which produces roots at nodes; for example, in *Cynodon dactylon*

striate – marked with parallel longitudinal lines, grooves or ridges

style – female part of the flower on which the stigma sits; absent in some flowers and remains (persistent) on some fruits, such as *Convolvulus* spp.

subtend – lie below

sucker – put up shoots from the root system

tendril – a stem, leaf or part of the leaf modified as a slender structure used for attachment support in climbing plants such as vetch

terminal – at the end of an axis such as a stem, branch or leaf stalk

time-controlled grazing (crash grazing) – similar to rotational grazing, but more intensive and involving more paddocks or subdivisions with electric fencing; paddock moves are determined by plant growth – the faster the growth, the more moves and vice versa – https://www.mla.com.au/research-and-development/Grazing-pasture-management/native-pasture/grazing-management/grazing-strategies/

transverse – in a crosswise direction at right angles to the main axis

truncate – cut off squarely

tuber – a swollen end of an underground stem that contains food reserves and usually buds for future growth

tubular – shaped like a tube; that is, a hollow cylindrical shape

umbel – a flower head with stalked flowers arising from the top of a common stalk

valves – parts into which the wall of a fruit may split to release the seeds

whorl – a ring of organs of the same kind (for example, leaves) arising from an axis at one level

Notes

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