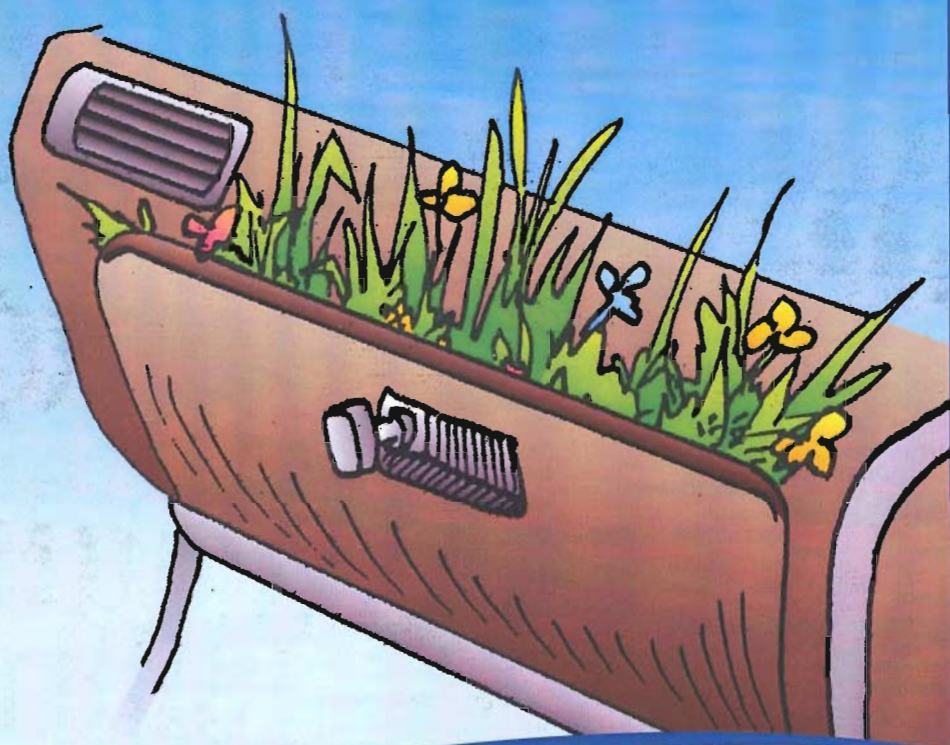


The glove-box guide to
grass and legume
identification

in Tasmanian pastures



Department of
Primary Industries, Parks, Water and Environment



About this book

This book will enable pasture managers to identify most of the species of grass and legume that are in their paddocks.

The book is focused on those species of grass and legume, both desired and weedy, commonly found in pastures. **Species which are found only in un-grazed areas have not been included.** To include them might give the identifier false trails to follow.

Sedges and tussocks are common in some environments but they have not been included in this book. **Broadleaf weeds** have also been left out but are covered in excellent DPIPWE books by Hyde-Wyatt and Morris (see 'further reading' page 79).

Because management decisions need to be made in all seasons, **the focus is on the vegetative state; that is, without seedheads.** However, a brief description of the seedhead is included to complete the picture.

The information given on the agronomic features is intended only to place the species in their environments.

Scientific terms and plant features essential for describing pasture plants are explained in pages 8 to 13 of this book. **If these terms and features are committed to memory, reading the text will be far easier.**

The species pages are grouped so that species with similar features are together. If the species initially sought doesn't seem quite right, flip the page and try the neighbouring species.

Take your time. Even proficient observers need to **be patient, look closely and take in all the plant's features.**

2 Acknowledgments

The work of a number of artists has been used to illustrate this book in order to show the species as we see them in the field in Tasmania.

Many thanks to the artists and their publishers for their kind permission to use these drawings and photos. More of the artists' work can be enjoyed in the books on the further reading list. These books also have comprehensive information on a wider range of species.

Peter Ball, Doug Friend and Andrea Hurst of the Tasmanian Institute of Agricultural Research (TIAR) contributed to the production of this book. Thanks also to other DPIWE and TIAR staff who are working to make Tasmania's pastures more productive and sustainable and who provided information for this book.

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2nd edition 2009

ISBN 978-0-7246-6778-9

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Tasmania

Explore the possibilities

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From 'Grasses of Temperate Australia, A Field Guide'
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Drawings, particularly legumes are widely used.
Permission of the Western Australian Herbarium

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Photos from 'Identification Handbook for Native Grasses in Victoria'
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Disclaimer:

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Identification features of grass (vegetative stage)	8
Describing grass seedheads.	10
Identification features of clovers and allied species.	12
Further reading	79
Botanical name (Alph. order)	Common name
<i>Agrostis capillaris</i>	Browntop (common bent)
<i>Aira species</i>	Silvery hairgrass
<i>Anthoxanthum odoratum</i>	Sweet vernal
<i>Bromus coloratus</i>	Coloured brome
<i>Bromus diandrus</i>	Great brome
<i>Bromus hordeaceus</i>	Soft brome
<i>Bromus willdenowii</i>	Prairie grass
<i>Cynosurus cristatus</i>	Crested dogstail
<i>Cynosurus echinatus</i>	Rough dogstail
<i>Dactylis glomerata</i>	Cocksfoot
<i>D. glomerata sub spp. hispanica</i>	Spanish cocksfoot
<i>Danthonia spp.</i>	Wallaby grass
<i>Ehrharta stipoides</i>	Weeping grass
<i>Elymus elongatus</i>	Tall wheat grass
<i>Elymus repens</i>	Rope twitch
<i>Festuca arundinacea</i>	Tall fescue
<i>Holcus lanatus</i>	Fog grass
<i>Hordeum murinum</i>	Barley grass
<i>Lolium multiflorum</i>	Italian & Tama ryegrass
<i>Lolium perenne</i>	Perennial ryegrass
<i>Lotus species</i>	Lotus (Trefoil)
<i>Medicago sativa</i>	Lucerne
<i>Medicago species</i>	Medics
<i>Phalaris aquatica</i>	Phalaris
<i>Phalaris minor & P. canariensis</i>	Annual phalaris
<i>Poa annua</i>	Winter grass
<i>Poa bulbosa</i>	Poa bulbosa
<i>Poa pratensis</i>	Kentucky blue grass
<i>Themeda triandra</i>	Kangaroo grass
<i>Trifolium ambiguum</i>	Caucasian clover
<i>Trifolium fragiferum</i>	Strawberry clover
<i>Trifolium pratense</i>	Red (cow-grass) clover
<i>Trifolium repens</i>	White clover
<i>Trifolium subterraneum</i>	Sub. clover
<i>Trifolium (small leaf annuals)</i>	Small leaf annual clovers
<i>Trifolium vesiculosum</i>	Arrowleaf clover
<i>Vulpia x 3 species</i>	Silver grass (Hair grass)

Species pages by common name(s)

One species may have several common names. Some common names may apply to more than one species. The name most usually used in Tasmania heads the description page for the species.

Common names (alphabetical order)	Page no.	Common names (alphabetical order)	Page no.
Aira	78	Path grass	18
Alfalfa	74	Perennial ryegrass	22
Annual Phalaris	36	Phalaris	38
Annual poa	18	Poa bulbosa	78
Annual ryegrass (Tama)	26	Prairie grass	54
Arrowleaf clover	62	Red clover	72
Ball clover	76	Rope twitch	60
Barley grass	58	Rough dogstail	34
Bent grass	30	Silk grass	32
Bird's-foot trefoil	78	Silver grass	32
Browntop	30	Silvery hair grass	78
Caucasian clover	68	Soft brome	56
Cluster clover	76	Soft grass	48
Cocksfoot	14	Spanish cocksfoot	16
Coloured brome	50	Spear grass	52
Cowgrass clover	72	Strawberry clover	66
Crested dogstail	24	Sub. clover	70
Demeter (cultivar) fescue	28	Subterranean clover	70
English couch grass	60	Suckling clover	76
English grass	22	Sweet vernal	46
Fescue (Tall)	28	Tall fescue	28
Fog grass	48	Tall wheat grass	78
Great brome	52	Trefoil	76&78
Hairgrass	32	Twitch	30&60
Hop clover	76	Vulpia	32
Italian ryegrass	26	Wallaby grass	42
Kangaroo grass	40	Weeping grass	44
Kentucky blue grass	20	White clover	64
Lesser canary grass	36	Winter grass	18
Lotus	78	Yellow suckling clover	76
Lucerne	74	Yorkshire fog	48
Medics	78		
Microlaena	44		

Grass identification table (vegetative stage)

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Hairs	Emerging leaf	Auricles	Interesting features	Species	Page	
H A I R L E S S	Folded Emerging leaf	Auricle ✗	Big white ligule. Often large with broad leaves. Leaves folded.	Cocksfoot	14	
		Auricle ✗	Like traditional cocksfoot but with narrower, finer leaves, more tillers and not so clumpy.	Spanish cocksfoot	16	
		Auricle ✗	Big white ligule for a small plant. Leaves folded.	Winter grass	18	
		Auricle ✗	Small individual shoots from bulbs.	Poa bulbosa	78	
	Rolled emerging leaf	Folded leaf but it may appear to emerge rolled	Auricle ✗	Narrow leaves with a central wide "groove". Rhizomes	Kentucky bluegr.	20
			Auricle ✓	Narrow, ribbed leaves with a shiny, waxy back. Red tiller base.	Perennial ryegr.	22
			Auricle ✗	Narrow ribbed leaves with a shiny back. No red tiller base.	Crested dogstail	24
		Usually rolled (may be folded on young tillers)	Auricle ✗	Small lightweight annual found on poor dry soils. Large ligule.	Aira species	78
			Auricle ✓	Like perennial ryegrass but broader. Recent cultivation?	Ital. & Tama ryegr.	26
			Auricle ✓	Broad leaf with deep ribs and short bristles on auricles.	Tall fescue	28
			Auricle ✗	Rhizomatous, grows in patches and has short, quite narrow leaves.	Browntop	30
	May be folded or rolled	Auricle ✗	Dark green with very narrow leaves.	Silver gr. (<i>Vulpia</i>)	32	
		Auricle ✗	Significant ligule. Broad leaves that are not stiff and erect.	Rough dogstail	34	
		Auricle ✗	Big ligule and a pink base if bruised or cut. Broad, stiff and erect leaves. No rhizomes.	Annual phalaris	36	
Auricle ✗	Big ligule and a pink base if bruised or cut. Broad, stiff and erect leaves. Rhizomes.	Phalaris	38			

Work this way → to find the most likely species page

H A I R Y	Folded emerg. leaf	Auricle ✗	Native; large. Often reddish. Long hairs at blade-sheath junction.	Kangaroo grass	40
	Emerg. leaf folded but in-rolled	Auricle ✗	Native, narrow grey-green leaves. Tuft of hairs at blade-sheath junction	Wallaby grass	42
		Auricle ✓	Native; short, wide leaves with thick edges. Long hairs on the auricles.	Weeping grass	44
	Rolled emerging leaf	Auricle ?	Longer hairs at the blade-sheath junction.	Sweet vernal	46
		Auricle ✗	Short, soft hairs all over and pink stripes at the tiller base.	Fog grass	48
		Auricle ✗	Cultivated. Hairs very visible on the leaf margins. Pink stripes sometimes. Short ligule.	Coloured brome	50
		Auricle ✗	Both have large broad leaves and hairs are very thick on the leaf sheath.	Great brome	52
		Auricle ✗	Both have long toothed (or ragged) ligules.	Prairie grass	54
		Auricle ✗	Smaller than the two big bromes. Most likely brome in pasture.	Soft brome	56
		Auricle ✓	Soft leaves that twist towards the point.	Barley grass	58
Auricle ✓		Grows in thick patches and has thick rhizomes.	Rope Twitch	60	
Varies	Auricle ✓	Hairs sparse or absent. Uncommon unless sown into saline areas.	Tall wheat grass	78	

Ask yourself: Is the plant hairy or hairless? **Next**, do the leaves emerge folded or rolled? **Then** look for auricles. **In the next column**, the species' more interesting features are listed. **Go** to the species page and if the description doesn't seem quite right **try the pages either side** because species with similarities are grouped together *as much as is possible*. In grazed pastures, it is very likely, *but not certain*, that you will be looking at one of the above species.

8 I.d. Features for Grasses:

Ligule: Usually a white membrane (like a lace collar). Length varies as does the angle of the top. The top can be ragged to smooth.

Auricles: Either present, like clasp claws, or absent. Size and style vary to some extent.

Blade-sheath junction:

The location of the emerging leaf, ligule, auricles and distinct hairs. These features are constant in a species and therefore important for identification.

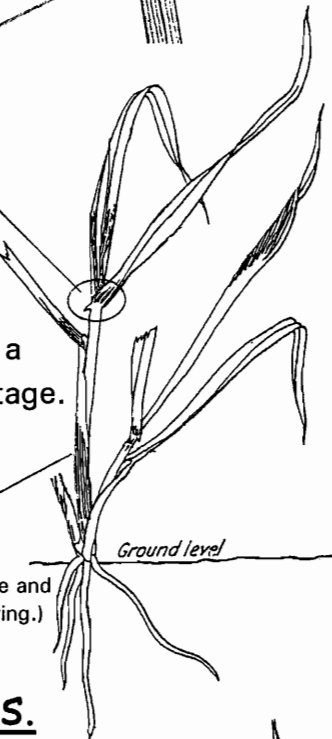
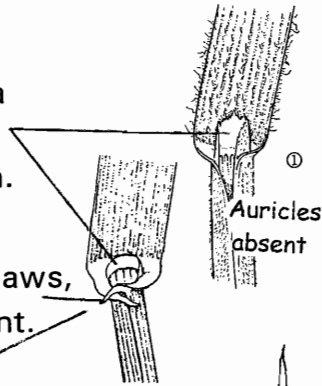
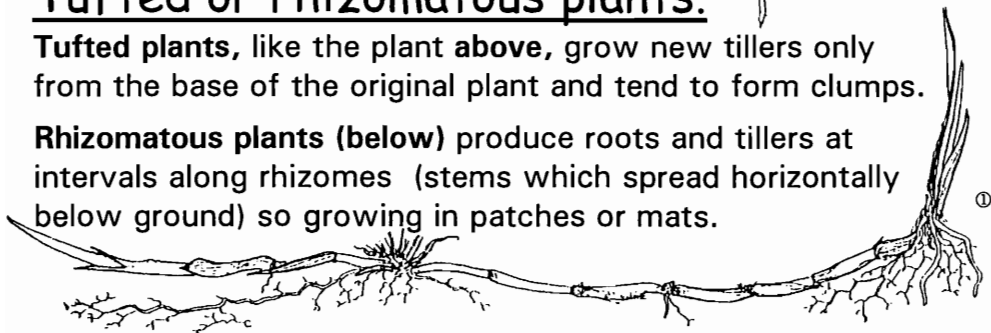
Tillers: Semi-independent sections of a plant, consisting mostly of leaves at this stage.

Leaf sheath: The lower part of the tiller where the leaves are either rolled or folded together. (Not the true stem, which is at the base and extremely short in the vegetative stage, elongating when flowering.)

Tufted or rhizomatous plants.

Tufted plants, like the plant above, grow new tillers only from the base of the original plant and tend to form clumps.

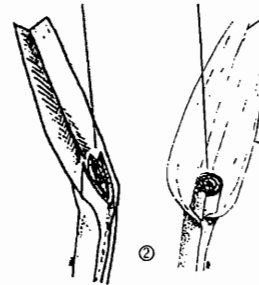
Rhizomatous plants (below) produce roots and tillers at intervals along rhizomes (stems which spread horizontally below ground) so growing in patches or mats.



Vegetative stage (without seedheads)

Leaf blades

On emergence:
Folded or rolled



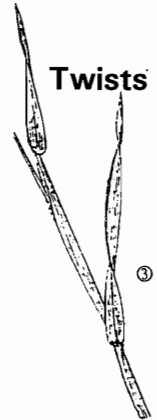
Ribs:

Absent (or very faint), deep right across or only on the centre line.

Leaf margins:
Abrasive or thickened.

Leaf back:
How shiny?

Twists

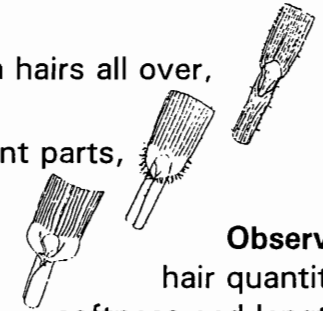


Hairs

There are species with hairs all over,

other species with hairs on certain plant parts,

and on many species, hairs are absent.



Observe:
hair quantity,
softness and length.

Colour of the tiller base

- A red tiller base is common to several species.
- It may be necessary to scrape (e.g. ryegrass) or bruise (phalaris) the tiller base to see the colour.



Seed remains found amongst the roots may give a clue to the identity of seedlings.



Colour (shade of green) and growth habit (size and erectness) are useful for identification but be aware that these aspects of the appearance of grass may change with conditions like moisture and fertility.

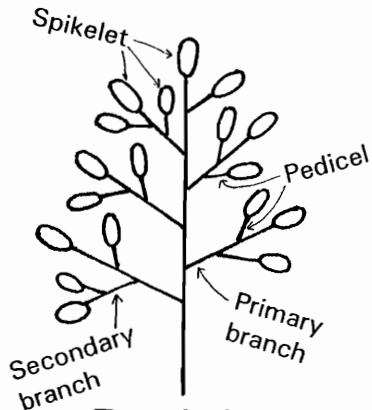
Describing Grass

Most seedheads are either a

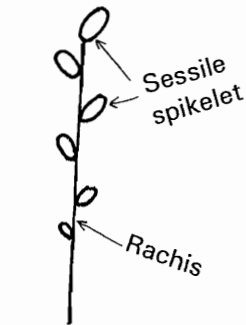
Panicle... A complex branched seedhead (inflorescence). Branches, *often with secondary branches*, come off the main stem and the spikelets (basic unit of flower and seed) are on stalks; e.g. browntop.



or a **Spike**... A simple seedhead with sessile spikelets (spikelets without stalks) on a central axis; e.g. ryegrass.



Panicle

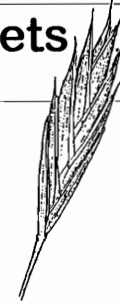


Spike

Other types of grass seedheads do occur, but most of the species found in Tasmanian pastures (and therefore in this book) have plain panicles or spikes. A few have **spike-like-panicles**, where the branches are very compressed so the seedhead looks like a spike but is actually a panicle.

Seedheads

Spikelets... are the basic unit of flower and seed consisting of one to many flowers.



Spikelets are made up of

Glumes... chaffy bracts which surround a spikelet.



and **Florets**... flower parts of a spikelet.



and sometimes

Awns... bristle like attachments to parts of the spikelet. Some grass species have awns and some don't.



Drawings: D.I. Morris

Panicle/Spike diagram: S.L. Duigan

12 Identification Features for

Clovers (*Trifolium*), Medics (*Medicago*)

Leaflet appearance



Size, shape, markings and toothed (or not toothed) margins. These can be useful but use caution as these features vary within a species because of the variety, environment or age of the plant.

Hairiness

A reliable feature.



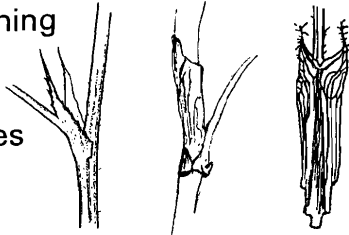
Stipules (appendages at the base of the leaf stems)

Colour of veining

Point shape

Toothed edges

Hairs



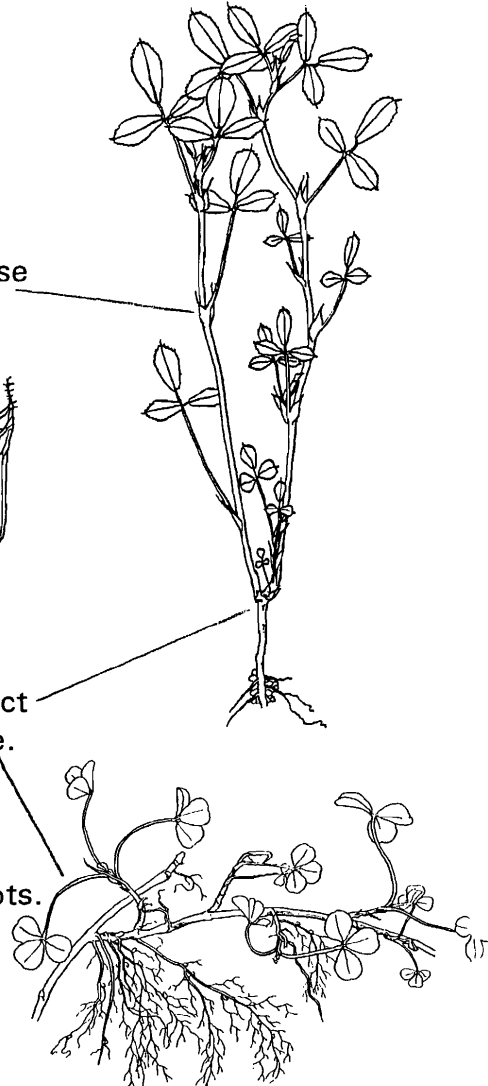
Erect or prostrate

Lucerne is an example of a very erect plant while white clover is prostrate.

Stolons

Creeping stems that send down roots.

White and strawberry clover both have stolons (are stoloniferous).



Clovers & Allied Species

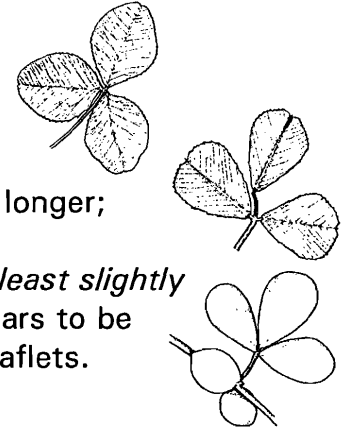
and Lotus & Trefoils (*Lotus*)

Trifoliate leaf

On clovers the trifoliate leaf has equal length leaflet stalks.

With medics the central leaflet stalk is longer;

and with lotus species, which have at least slightly longer central leaflet stalks, there appears to be five leaflets, as the stipules look like leaflets.

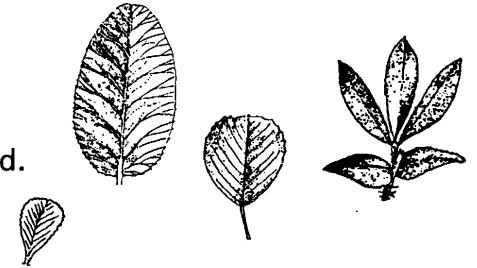


Leaflet veining

Many veins or very few.

Much branched or not branched.

Quite straight or more curved.



Flowers

Often quite distinct but be aware that several clover species have red, pink or purple coloured flowers.

Don't take the colourful names *too* seriously.



Legumes have character.

Knowing the type of environment they prefer, their life cycle and methods of reproduction is a good start to identification.

Dactylis glomerata
COCKSFOOT

Perennial

- Leaves broad, folded on emergence, with the leaf sheath and tiller base flattened.
- Ribs are indistinct.
- Hairless.
- Lighter green, usually.
- Long white ligule - no auricles.
- May be grazed down close but is often seen in large, aggressive clumps.

Seedhead An erect, one sided panicle with spikelets in dense clusters at the end of the branches.

Agronomic features....Tufted perennial....Cocksfoot is highly productive and responds well to summer rain....It handles lower fertility and is significantly more drought tolerant and grub resistant than ryegrass....If allowed to become over mature it may be avoided by stock....Seed is small and establishment slow....Prefers light, well drained soils.



Dactylis glomerata

16 *Dactylis glomerata* (Sub-species *hispanica*)

SPANISH COCKSFOOT

Perennial

Traditional, common cocksfoots in Tasmania, such as cultivar Porto, are described as 'intermediate types'.

- **Spanish cocksfoots can be distinguished from 'intermediate types' by the following features:**
 - Leaves are narrower/finer.
 - Higher tiller density.
 - Less likely to grow into clumps.
 - Crown is lower.
 - Colour is more grey-green than the 'intermediates'.

Seedhead Similar but shorter, smaller and tighter than the seedheads of 'intermediate type' cocksfoots.

Agronomic features....More summer dormancy results in an even higher level of drought tolerance but a poorer response to summer rain than traditional 'intermediate' cocksfoots...
...Grows well in autumn and winter, as do 'intermediate types', but suffers less frost damage....Tolerant of acid soils....Dense tillering habit and fine leaves make it ideally suited to grazing by sheep.



Spanish Cocksfoot has the same features as traditional cocksfoots (see previous pages) but is finer leaved, more densely tillered and less likely to become clumpy.

WINTER GRASS (Path grass)*Annual*

- Very short lived, autumn germinated plants flowering before the end of winter.
- Small, tufted, light green and hairless.
- Emerging leaf is folded flat, it has a boat bow tip and a single mid-line rib (looks like a groove) on the upper surface. This leaf form is common to other poa species such as Kentucky blue grass and *Poa bulbosa*.
- A large white ligule for such a small plant.
- No auricle.

Seedhead Open, loose panicle seen most of the year round but particularly in late winter. Small oval seed.

Agronomic features....Emerges, produces seed and dies faster than anything else.... Often pulled out of the ground when grazed because of a limited root system.... Common, growing in bare ground (even gravel) both in gardens and in paddocks.

*Poa annua*

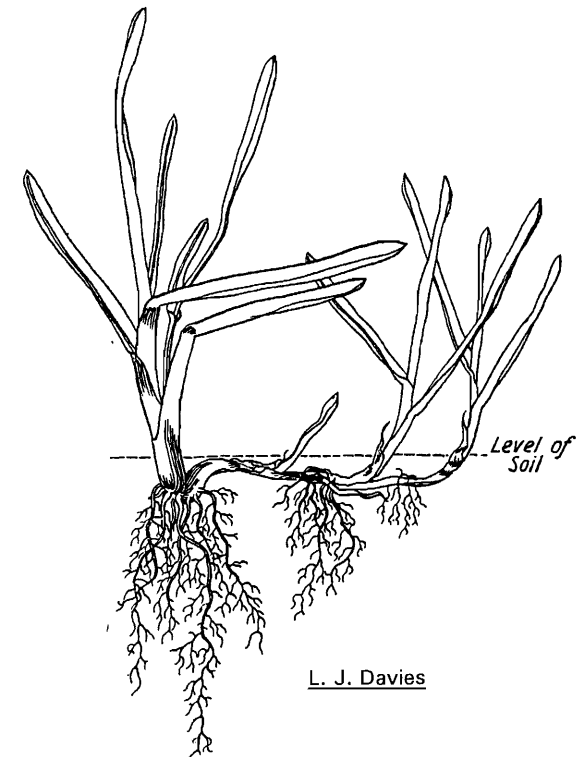
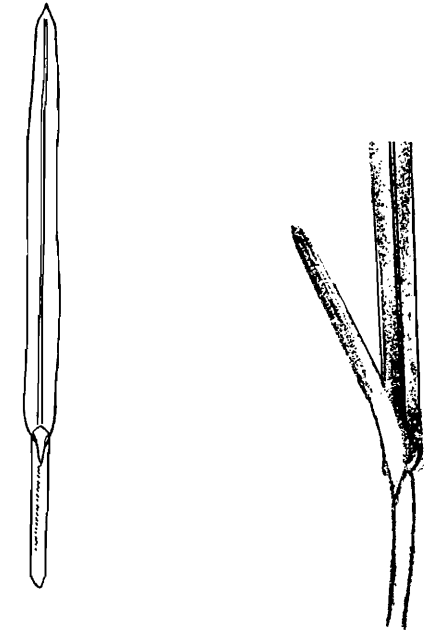
KENTUCKY BLUE GRASS*Perennial*

- Like perennial ryegrass, the leaves are fairly narrow, but their upper surface has a single, mid-line rib (groove). The leaf tip is like a boat bow (typical poa).
- Leaf back is faintly lined: It can be slightly shiny but isn't waxy like ryegrass.
- Dark blue-green, to the naked eye is hairless and is often affected by orange-brown rust.
- Emerging leaf is folded - leaf sheath is flattened.
- No auricles or red base (ryegrass has both).
- Instead of being tufted, like ryegrass, tillers emerge across a patch of ground. They shoot at intervals along spreading rhizomes.

Seedhead An open panicle. The spikelets are small; often with purple colouration.

Agonomic features....Common but not usually regarded as a useful pasture species or as a pasture weed... Bluegrass seems to be easily over-grown by ryegrass etc. if these species are performing....Tolerant of cold, drought and trampling....It can be confused with ryegrass giving a false impression of the quality of a pastureGood turf species.

D. I. Morris



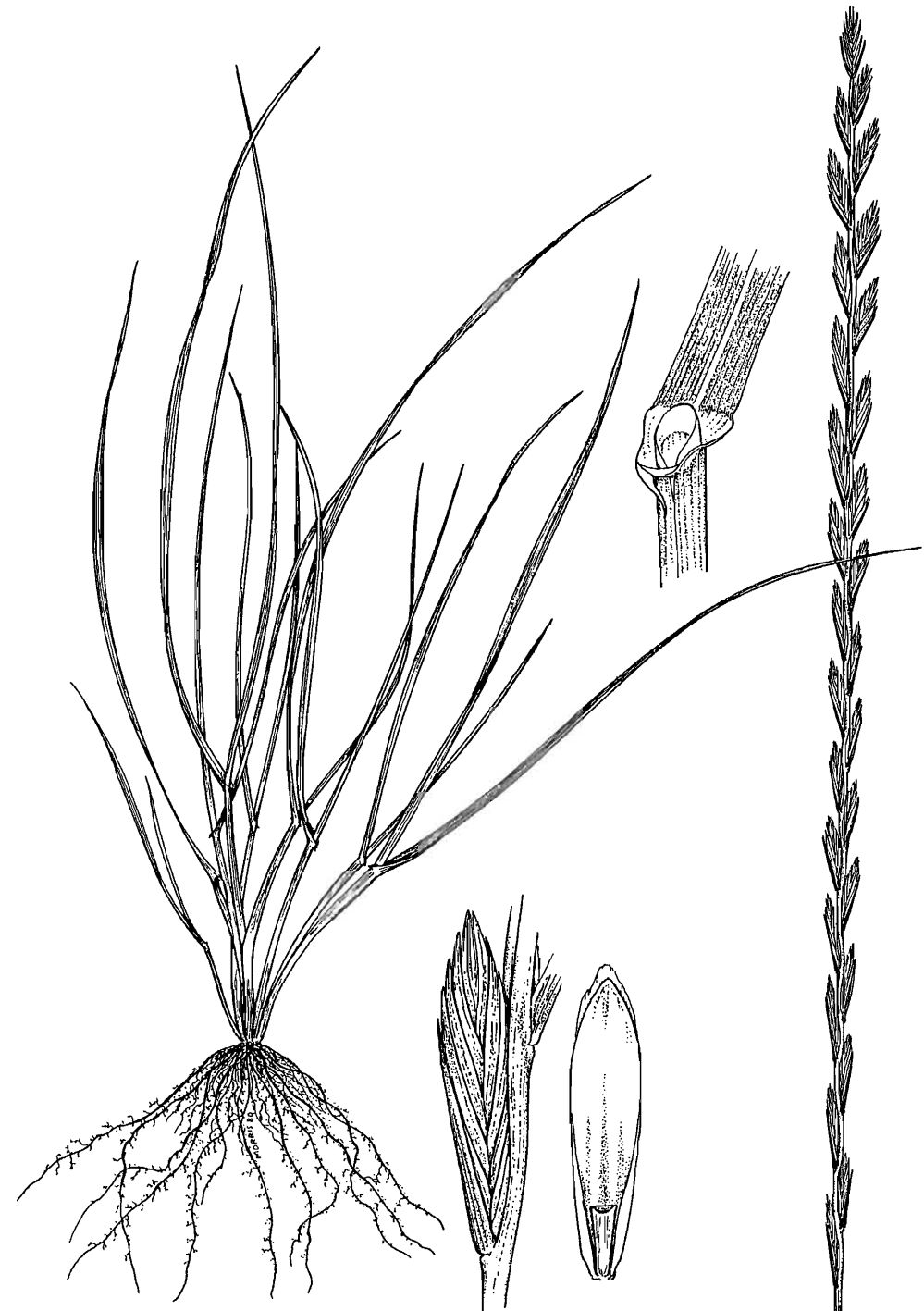
L. J. Davies

PERENNIAL RYEGRASS*Perennial*

- Long, narrow, pointed leaf with a ribbed upper surface and a shiny, waxy back.
- Dark green and hairless.
- Leaf blades look folded; at emergence they are usually folded but may appear rolled because the leaf sheath is more round than flattened.
- Auricles are narrow. Not obvious on young tillers.
- Ligule is very short.
- Grows in tufts. Very palatable so is often grazed down hard in preference to other species.
- Red tiller base. Often hidden by brown tissue. Use caution with this feature as other species, in certain conditions, may have red tiller bases.

Seedhead A spike up to 20 cm long with the 1.5 cm spikelets recessed into the axis. Without awns.

Agronomic features....Highly palatable and productive but likes good conditions.... Susceptible to grubs....Some cultivars are bred for drier areas....Good seedling vigour.

*Lolium perenne*

CRESTED DOGSTAIL*Perennial*

- Looks like perennial ryegrass when vegetative but does not have an auricle or a red base.
- Tufted, essentially hairless and dark green.
- Leaves are ribbed, fairly narrow and have a shiny, waxy back (like ryegrass). The midrib is slightly more prominent.
- Leaf cross section is “U” shaped to flat, not folded as the leaf of perennial ryegrass usually is.
- Emerging leaf is usually rolled but may be folded on young tillers.
- Ligule is very short and hard to see.

Seedhead Spike-like panicle. Only 2 or 3 mm wide but often over 50 mm long. The short and relatively wide spikelets tend to one side of the axis and are very dense. Very short awn (1 mm).

Agronomic features.... Occasionally found in pastures where it may be confused with perennial ryegrass.... Low production and has a low leaf to stem ratio.... Not known to have been recommended for Tasmanian pastures.



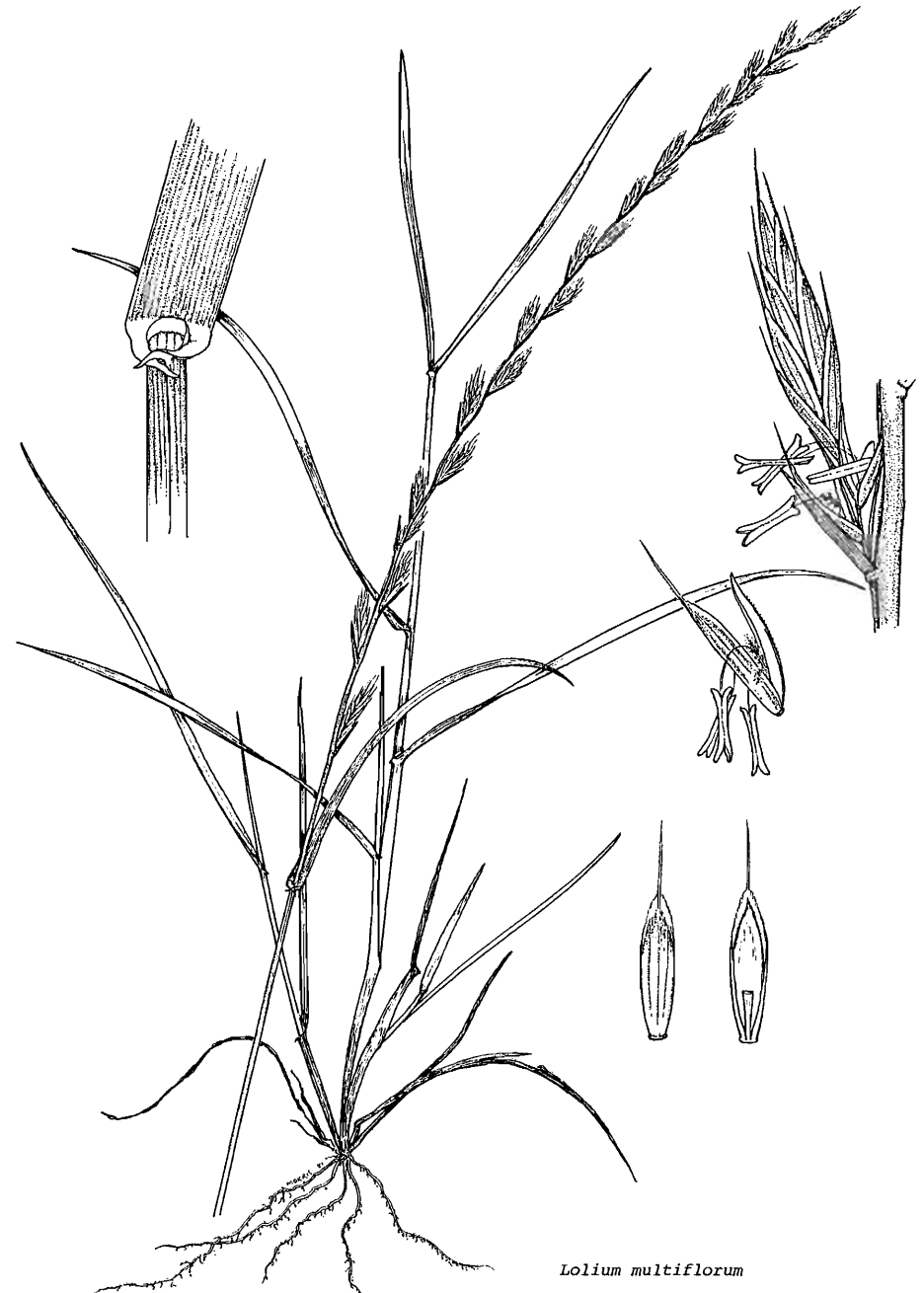
JF

ITALIAN & TAMA RYEGRASS*Short lived and Annual*

- Like perennial ryegrass but bigger and bolder with broader leaves.
- Tama is broader and bolder again, in comparison to Italian ryegrass.
- Hairless and dark green.
- The leaves are long, pointed and ribbed, with a waxy back. Like perennial ryegrass but broader and flatter.
- Emerging leaf is definitely rolled.
- Auricles are big - The ligule is very short.

Seedhead A classic spike much like perennial ryegrass but with short awns.

Agronomic features....Highly palatable and productive....Tama is an annual while Italian lasts 2 to 4 years....Produces better in winter than perennial ryegrass....Very responsive to nitrogen applications....Tolerates wet conditions better than oats.

*Lolium multiflorum*

Festuca arundinacea
TALL FESCUE

Perennial

- Leaves are broad, coarse and stiff with a deeply grooved upper surface and an abrasive edge. The leaf back is shiny with lines of thickening.
- Hairless other than short bristles on the auricle.
- Rolled emerging leaf.
- Tufted, usually erect and stiff in growth habit.
- A delightful mid-green.
- Ligule is inconspicuous.

Seedhead Erect panicle. Heavy spikelets are on branches which are held close to the long axis at first but open out with maturity.

Agronomic features....Palatable, productive and persistent once established....Common cultivars, including Demeter, are summer active....Tolerant of waterlogged soils and moderate salinity....Tolerates root feeding cockchafer but is not much better than ryegrass with surface feeding grubs....Seedlings are poorly competitive. Establishment methods that don't take account of this may help explain why tall fescue is not more prominent in Tasmanian pastures.

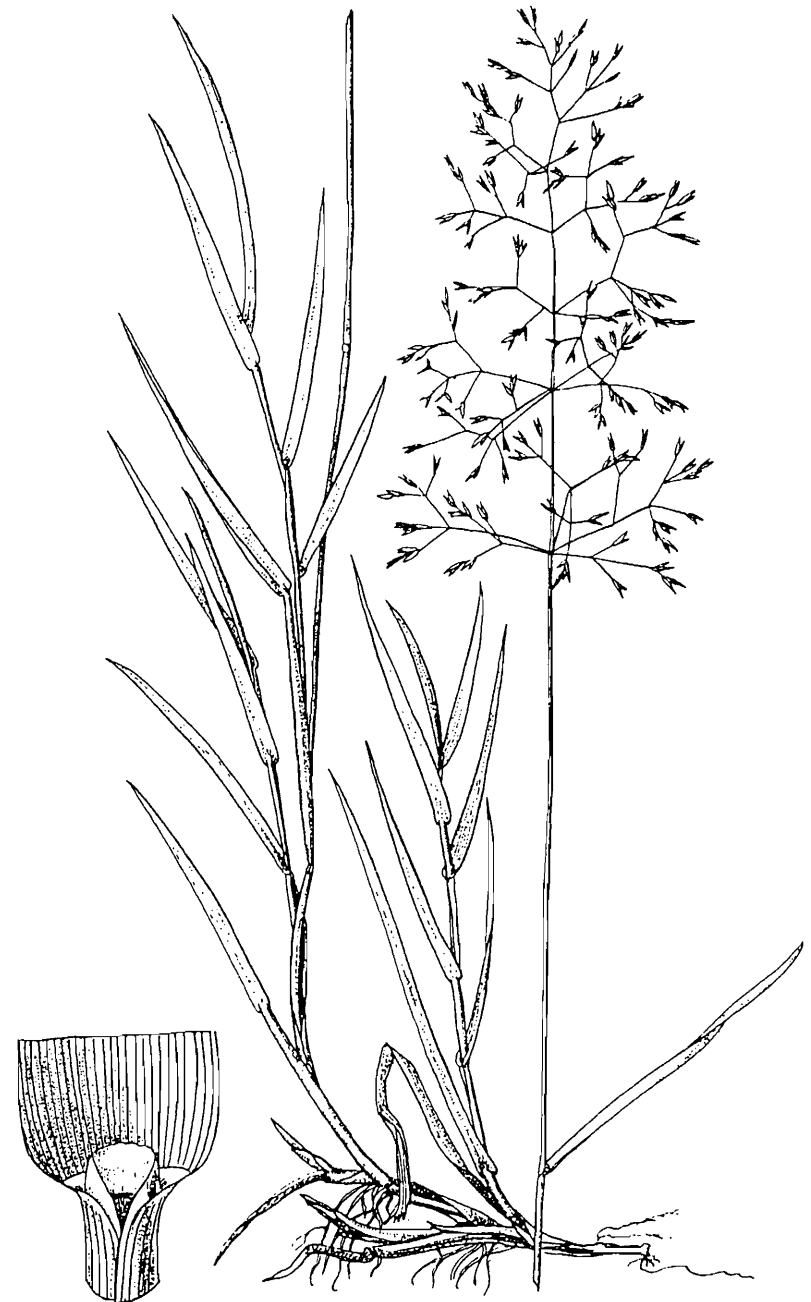


BROWNTOP (Common bent)*Perennial*

- Hairless.
- Many short, narrow, ribbed leaves that appear to be at angles from each other.
- Shoots from rhizomatous roots and thereby spreads in dull-green patches.
- Rolled emerging leaf.
- No auricle.
- Ligule; obvious but very short (like a priest's collar).

Seedhead Lightweight, spreading panicle with spikelets 2 to 3mm long. The brown, lacy appearance of the seedhead remains with an infested pasture for much of the year.

Agronomic features....A perennial, creeping, slow and persistent ruiner of pasture....Tolerates and so invades areas of low fertility....Suppresses and replaces productive species....Low palatability....Low production....Special techniques are required to remove browntop during pasture renovation.



32 *Vulpia bromoides, myuros or megalura*

SILVER GRASS

(also hair or silk grass and squirrel, fox or rat's tail fescue)

Annual

- An annual that germinates in large numbers.
- Hairless (*to the naked eye, if not completely*).
- Leaves are dark green, slender, pointed and ribbed with a back that is slightly glossy but not waxy like ryegrass.
- Emerging leaf is rolled.
- No auricles and the ligule is inconspicuous.
- Sometimes appears branched and curved as a seedling but grows up erect and straight, either as solitary tillers or as multi-tillered tufts.

Seedhead An erect panicle with one or more long, thin spikelets containing awned seeds.

Agronomic features....Palatable in winter but not producing a lot of feed....Goes to seed rapidly in spring, losing palatability and drying off....Many large seeds makes it very competitive in autumn and with new pastures....Favours open locations with drier soil types.



A *V. bromoides*
B *V. myuros*
C *V. megalura*

D. I. Morris

ROUGH DOGSTAIL*Annual*

- Tufted, hairless and light green. Pale at the base of the tiller.
- Leaf form is neither sharply folded like cocksfoot nor stiff and erect like phalaris.
- Leaves are rolled on emergence and broad.
- No auricles but the pale collar at the base of the leaf blade may wrap around the stem. However, this is not an appendage as an auricle is.
- Ligule is obvious and slightly toothed.

Seedhead Dense, oval panicle; only 3 to 4 cm in length with all its branches on one side of the stem. Its fine, wavy awns give a bristly appearance.

Agronomic features....A weed of roadsides and waste areas that may invade poor pastures.... More likely to be on light soils in low rainfall areas....Germinating rough dogstail might be mistaken for young cocksfoot.... Unproductive and rarely noticed (except its distinctive seedhead).



ANNUAL PHALARIS

Annual

- Many features in common with perennial phalaris (*P. aquatica*) such as:
 - Hairless.
 - Broad leaves with fine ribs that are rolled on emergence.
 - A long and very obvious ligule but no auricle.
 - Base is pink or red, especially when bruised or cut.
- Differences from perennial phalaris include:
 - Perennial phalaris has short rhizomes and so forms permanent, spread out patches of plants. Annual phalaris, in contrast, relies on annual seeding and produces an abundance of new plants around the old plant's base.
 - Annual phalaris has small roots, no rhizomes.

Seedhead A compact, awnless, spike-like panicle. Looks similar to perennial phalaris but is usually smaller, and with *P. canariensis*, the seedhead is more conical than cylindrical in shape. Seed is small and shiny.

Agronomic features...Annual Phalaris is a minor weed of cultivated ground, sometimes invading pastures.



Phalaris aquatica
PHALARIS

Perennial

- Broad, flat, pointed leaves with fine ribbing; stiff and erect.
- Hairless and often a lighter green colour.
- Ligule is long and very obvious - No auricle.
- Leaf rolled on emergence like a tight tube (cocksfoot leaves are folded on emergence).
- Base colours pink when bruised or red when cut.
- Has short rhizomes so may grow in patches.

Seedhead A spike-like panicle; compact and cylindrical (like possum dung).
 Awnless. The seed is small and shiny (canary seed).

Agonomic features.... Likes heavier soils.... Robust, drought and grub tolerant.... Highly productive.... Needs to be managed in spring to prevent it becoming over dominant.... Slow to establish.... Phalaris is associated with an alkaloid toxicity problem for sheep (sometimes cattle) under certain conditions.



D.I. Morris (except seedhead)
 C.A. Gardner (seedhead)

KANGAROO GRASS*Perennial*

- Tussocky, large, bold looking plant.
- Leaves are folded on emergence. They are "V" shaped, taper to a long point and are coarse and stiff.
- Long hairs arise from the blade-sheath junction and along the lower leaf margin. The leaf sheath may have some soft, wavy hairs.
- Fresh growth is green but it turns red-purple with maturity and winter cold.
- No auricle, and the ligule is well hidden.

Seedhead Big, reddish, gnarled looking panicle with long, twisted awns. Very distinctive.

Agronomic features....Native perennial....Deep rooted.... Capable of rapid growth in spring and summer.... Drought tolerant....Frost sensitive....Abundant in natural areas that are lightly grazed....Promoted by spelling in spring and summer....Mature foliage has low palatability.

Photo: J. Schneider



Drawings: D. I. Morris

WALLABY GRASS*Perennial*

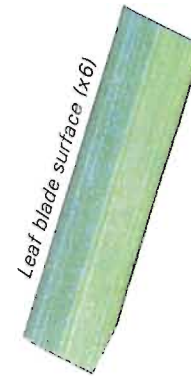
- Tufted (tillers in a tight cluster). These clusters can be large, forming a patch.
- Leaves are narrow (typically 2 mm) and usually a grey-green colour. Ribbing is indistinct except for a line or two in the middle of the blade.
- Leaf hairs on many specimens are obvious but not dense. However, hairiness varies and hairs may be short and hard to see.
- A distinctive tuft of stiff hairs, always, at the blade-sheath junction.
- Auricles are absent - the ligule consists of hairs.
- Emerging leaf is folded, but it may appear rolled as the blade often has an in-rolled profile.

Seedhead A dense panicle which is, on most species, fluffy at maturity. It has hairy seeds.

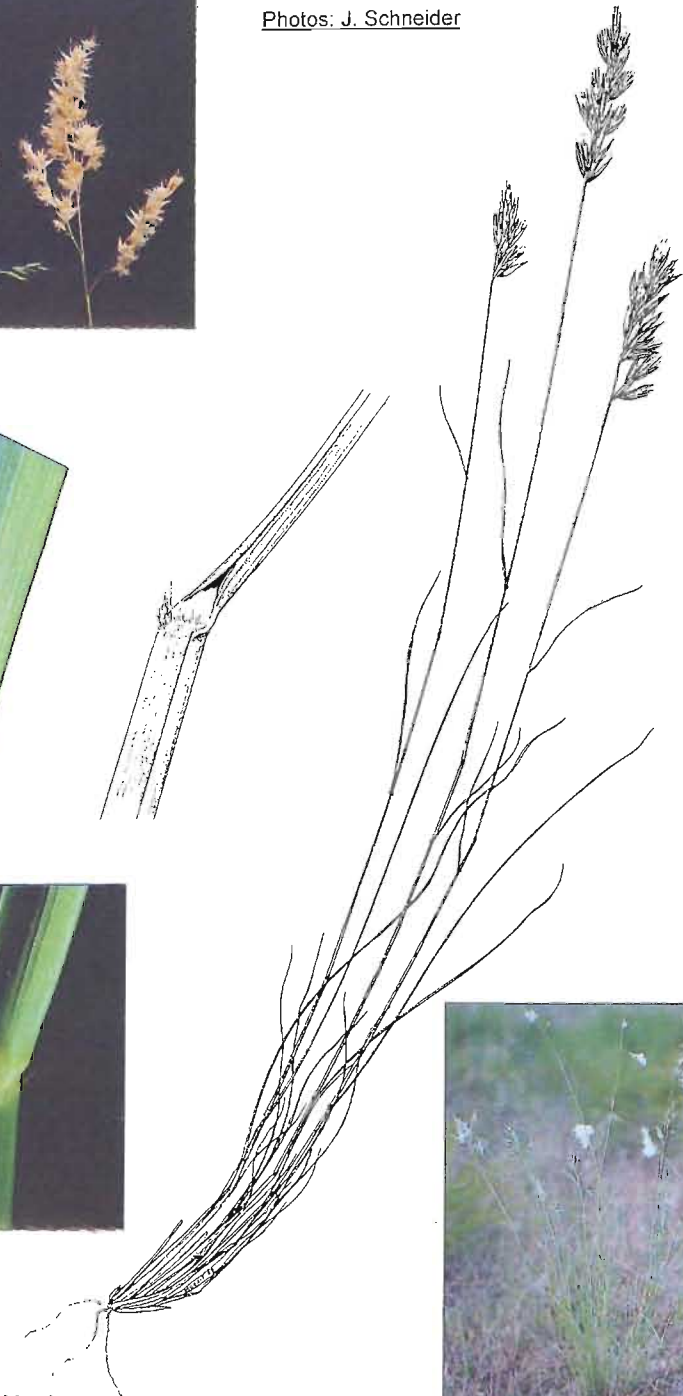
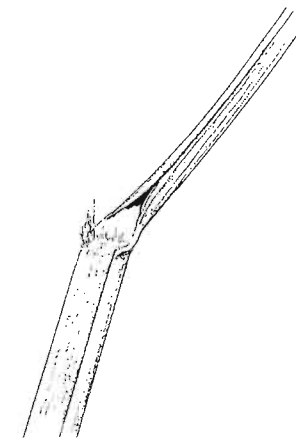
Agronomic features...A valuable native grass due to its persistence and production in non-arable or unimproved land. Also occurs in degraded improved pastures.



Photos: J. Schneider



Leaf blade surface (x6)



Drawings: D. I. Morris



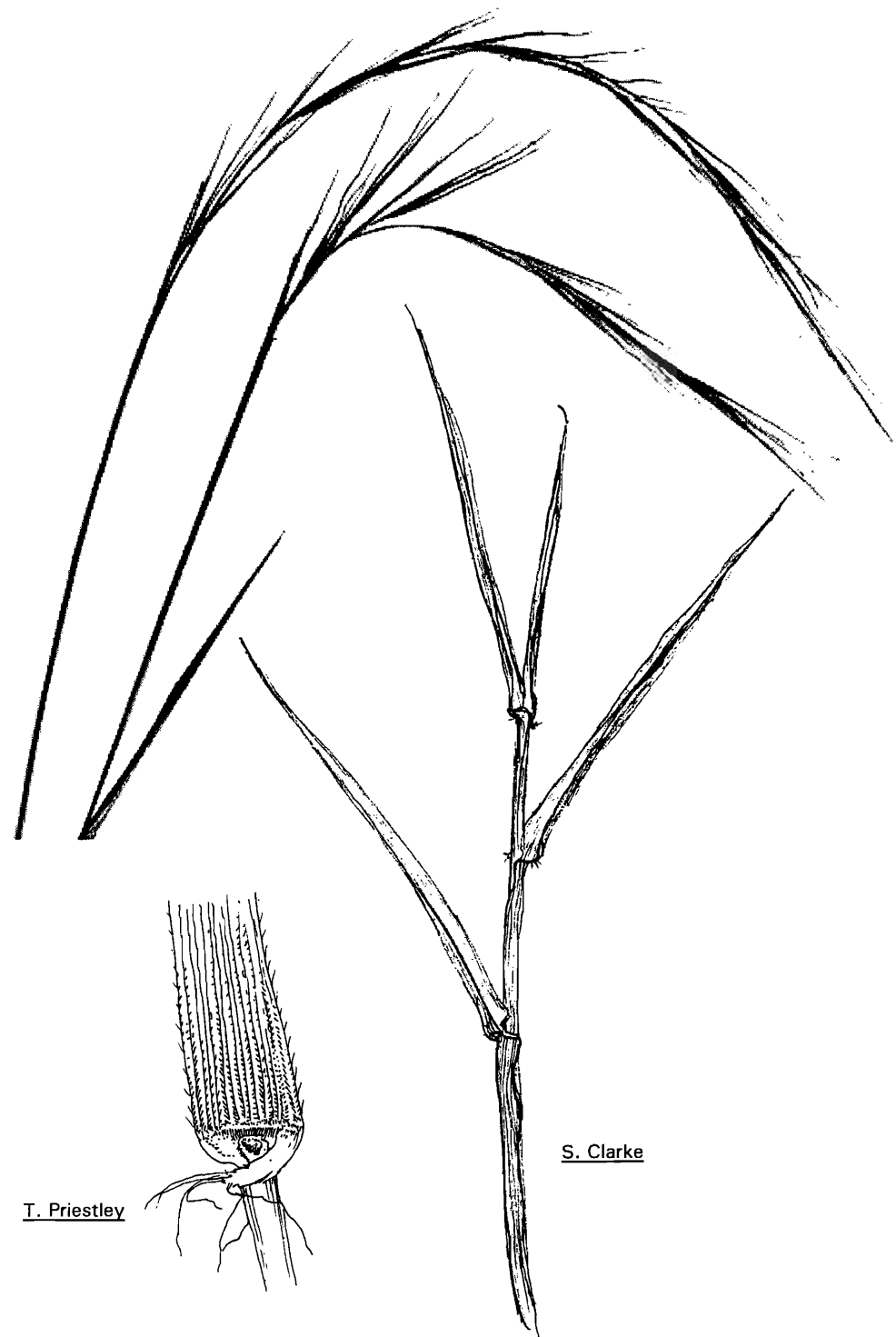
WEeping GRASS

Perennial

- Leaves are rolled on emergence. The upper surface is ribbed. Edges are often thickened and usually have an indentation near the tip.
- Hairs are obvious but their density varies across the plant.
- Auricles are obvious and have long hairs.
- The ligule is not obvious.
- The relatively short and broad leaf blades join the leaf sheath with wide angles.
- Spreads by underground stems (rhizomatous).

Seedhead A panicle with branches spread out over as much as 25 cm of its main axis giving the seedhead a weeping, light-weight appearance. Long, rough awns.

Agronomic features.... Native....Widespread in natural and native pastures.... Occurs in degraded improved pastures....High forage quality....Tolerant of heavy grazing pressure, low fertility and drought....Responds well to increased fertility....Tends to be winter dormant in Tasmania.



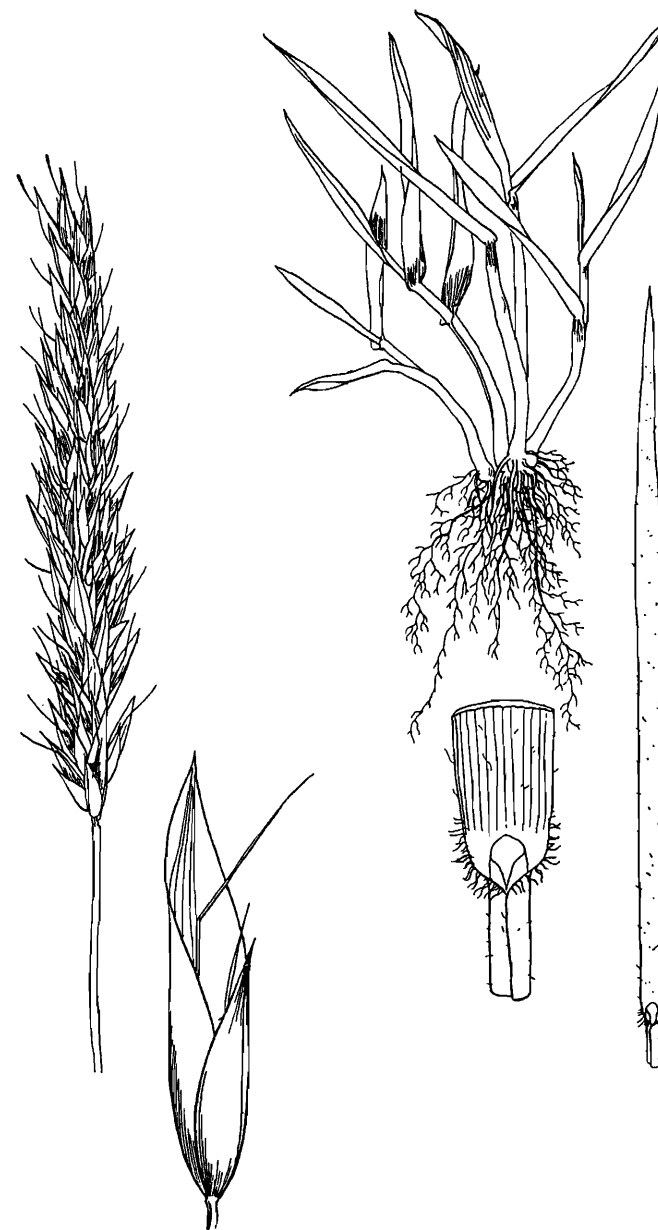
Anthoxanthum odoratum
SWEET VERNAL

Perennial

- Tufted; mid-green. In moist conditions it looks soft but when dry it looks flat and harsh, unlike fog grass which appears soft all the time.
- Leaves are rolled on emergence, are curved or flat in profile and have fine ribbing.
- Hair at the blade-sheath junction, always. The leaf margin usually has hairs. On other surfaces, hairiness is very variable.
- *True* auricles (appendages) are minute. However, on mature plants a collar may extend from the leaf blade and wrap around, resembling an auricle.
- Ligule shows 1 to 3 mm: Slightly toothed top.
- Pleasant hay or vanilla like scent when crushed.

Seedhead A dense, spike-like panicle with a dense fish-bone appearance (spikelets come from all around the stem).
 Green to brown-purple colouration.

Agronomic features....A weed that was introduced to give hay a nice smell....Low production and low palatability....
 Invades poor, open pastures.



FOG GRASS

(also Yorkshire fog or soft grass)

Perennial

- Leaves soft, broad, ribbed and mid-green.
- Short, soft hairs all over.
- Emerging leaves rolled.
- Ligule is medium size and ragged. No auricle.
- Pink or red stripes on the tiller base.
- It often forms a thick, clumpy sward with a lot of dead leaves at the base.

Seedhead A panicle producing many small seeds. Soft and dense in the early stages. Later the branches spread out. Colour varies from white to a pink-purple.

Agronomic features....Some value as pasture but has low palatability....Fog grass often dominates where there is low fertility, in damp areas and where there is not much grazing pressure....It suppresses better grass species and legumes....It exists in drier situations but does not dominate.



COLOURED BROME*Perennial*

- Hairs are dense but don't appear soft like fog grass hairs. Hairs are longer and more visible on the leaf margins.
- Leaves emerge rolled, are of medium width and have fine ribs on the leaf face.
- Leaf blades tend to a 'V' shape and have a prominent keel.
- Tufted and semi erect growth habit.
- Ligule smaller and not as distinctly ragged as some other bromes or fog grass. No auricles.
- Purple-pink stripes on some tiller bases, while other tillers on the same plant may have no colour. Colour is more consistent as the tillers go up to seed.

Seedhead Short, erect panicle with short branches. Spikelets are 14–18 mm long, have a typical 'brome' appearance and are distinctly stripy. Awns are 5–6 mm long.

Agronomic features....Coloured brome is a cultivated, long lived perennial....Needs well drained soils and good fertility...Good late spring, early summer growth....Remains palatable even when seeding....Not yet (2009) widely used.



GREAT BROME (Spear grass)*Annual*

- Tufted and usually large.
- Soft hairy, light green look.
- Longer hairs on margins of leaves.
- Rolled emerging leaf.
- No auricles.
- Ligule is long and jagged.

Seedhead A large, loose, nodding panicle with huge awns.

Agronomic features....Not many.... Common weed of waste areas and is occasionally seen in pastures.... It appears not to tolerate grazing.



*Bromus willdenowii**(synonyms are B. catharticus & B. unioloides)***PRAIRIE GRASS***Short lived perennial*

- Tufted, very upright and often large.
- Soft, hairy and light green.
- No auricles
- Ligule is long and has fine teeth on top.
- Rolled emerging leaf. Leaves have a gently folded profile.

Seedhead Large, open panicle. Spikelets are flattened, have very short awns and are on thin branches in groups of up to four.

Agronomic features....Usually a weed of waste areas....Low tolerance of over-grazing...A cultivar has been developed as an out of season fodder crop (Grasslands Matua) which is highly productive of palatable feed during winter.... Needs careful management and good fertility.



Bromus hordeaceus
SOFT BROME

Annual

- Soft and light green like barley grass.
- Hairy; more so on the stem.
- No auricle (barley grass has an auricle).
- Ligule is medium size and ragged.
- A small brome that is common in pasture.

Seedhead A loose, erect panicle. The spikelets are plump and have an appearance that is typical of bromes. There is a short awn. The glumes remain after seed-fall.

Agronomic features....An annual which is poorly productive because it goes to head early....Its large seeds are very competitive with improved species in autumn and during pasture renovation....Seed numbers should be reduced before sowing pasture.



Bromus hordeaceus (Bromus mollis)

BARLEY GRASS

Annual

- Lighter green, tufted and erect.
- Leaves are soft, of medium width, ribbed, rolled on emergence and twist towards the point.
- Hairiness varies but there are at least sparse hairs on the leaf blade and sheath.
- Auricles are large and obvious.
- Ligule is obvious but not long. Finely toothed top.

Seedhead Dense spike with large awns; looks like an ear of barley. The stems are often bent at the nodes.

Agronomic features....An aggressive invader of pastureFavours areas with a good nitrogen status....Provides significant feed in late autumn and winter during its vegetative stage but (as an annual) goes to seed early, losing palatability and digestibility.....The awned seeds cause a lot of skin damage to sheep and contaminate wool.

Sea barley grass *Hordeum marinum*: Similar to *H. leporinum* and *H. murinum* but without auricles and smaller and finer....Less hairiness....Common in saline areas.



Elymus repens
ROPE TWITCH

Perennial

- A largish, soft looking grass, that grows in spreading patches that are usually, but not always, quite dense. Light to grey green.
- Wide, shortish leaves which are rolled on emergence and twist towards the tips. Ribbed.
- Auricles, claw like but very slender and small, often missing or hard to see.
- Ligule is inconspicuous. (less than 1 mm long).
- Thick, straw coloured rhizomatous roots form a tangled mass and have thick, pointed tips.
- Fine hairs on leaf sheath, not so obvious on the leaf blade.

Seedhead A spike with short awns. The spikelets seem heavy but loose.

Agronomic features....The dense mat of rhizomes makes it a troublesome weed of arable land and gardens....Spreads easily by bits of rhizomes....Its effect on pasture is not clear; considering its invasive choking nature it is only rarely complained about by pastoralists....Prefers heavy soils but thrives on lighter soils in cooler, wetter environments.



ARROWLEAF CLOVER*Annual*

- Hairless.
- When young, arrowleaf clover has club shaped leaflets and looks like white clover except:
 - *Toothing on the leaf margins is more distinct.*
 - *First leaves to emerge from the seed are larger.*
 - *Stolons are absent so arrowleaf clover plants grow as individual rosettes. White clover has stolons and so spreads in patches.*
- As plants mature, leaflets become pointy and usually have distinct arrow shaped markings.
- Mature stems are thick, hollow and semi-erect.

Flower-head Similar to white clover at first. As more florets develop the flower-head grows large and develops a long oval shape. New florets are white, while the older florets further down the flower-head are pink.

Agonomic features....Suited to a range of soil types but must be well drained....Arrowleaf clover has deep roots and cultivars that are preferred for Tasmanian conditions, such as Arrotas, are late maturing; because of these two features arrowleaf clover has the ability to stay green, longer into summer than other annuals.



Young plants



Mature plants



Trifolium repens
WHITE CLOVER

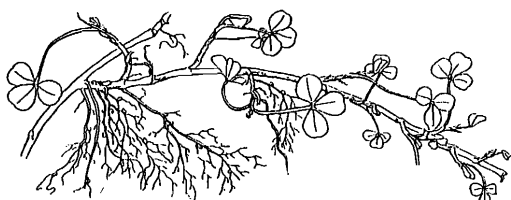
Perennial

- Puts down roots from stolons and thereby spreads in patches (Stoloniferous).
- Hairless.
- Stems and leaf backs are shiny.
- Heart shaped, round or oval leaflets which may or may not have white crescent markings.
- Stipules are smaller and have a short, needle-like point off a fairly blunt end as compared to strawberry clover which has a large stipule with a long drawn out point.

Flower-head Round and prominent with 30 to 40 white or pink flowers.

Agronomic features....Highly productive, grows well throughout the year, tolerates hard grazing and is adapted to a wide range of soils....Needs 700 mm plus annual rainfall (varies to some extent with soil type etc) to thrive as a perennial.... Below that rainfall, as in much of the Tasmanian Midlands, it may exist, putting on a show in favourable years.

Stoloniferous habit



L. J. Davies



D. I. Morris

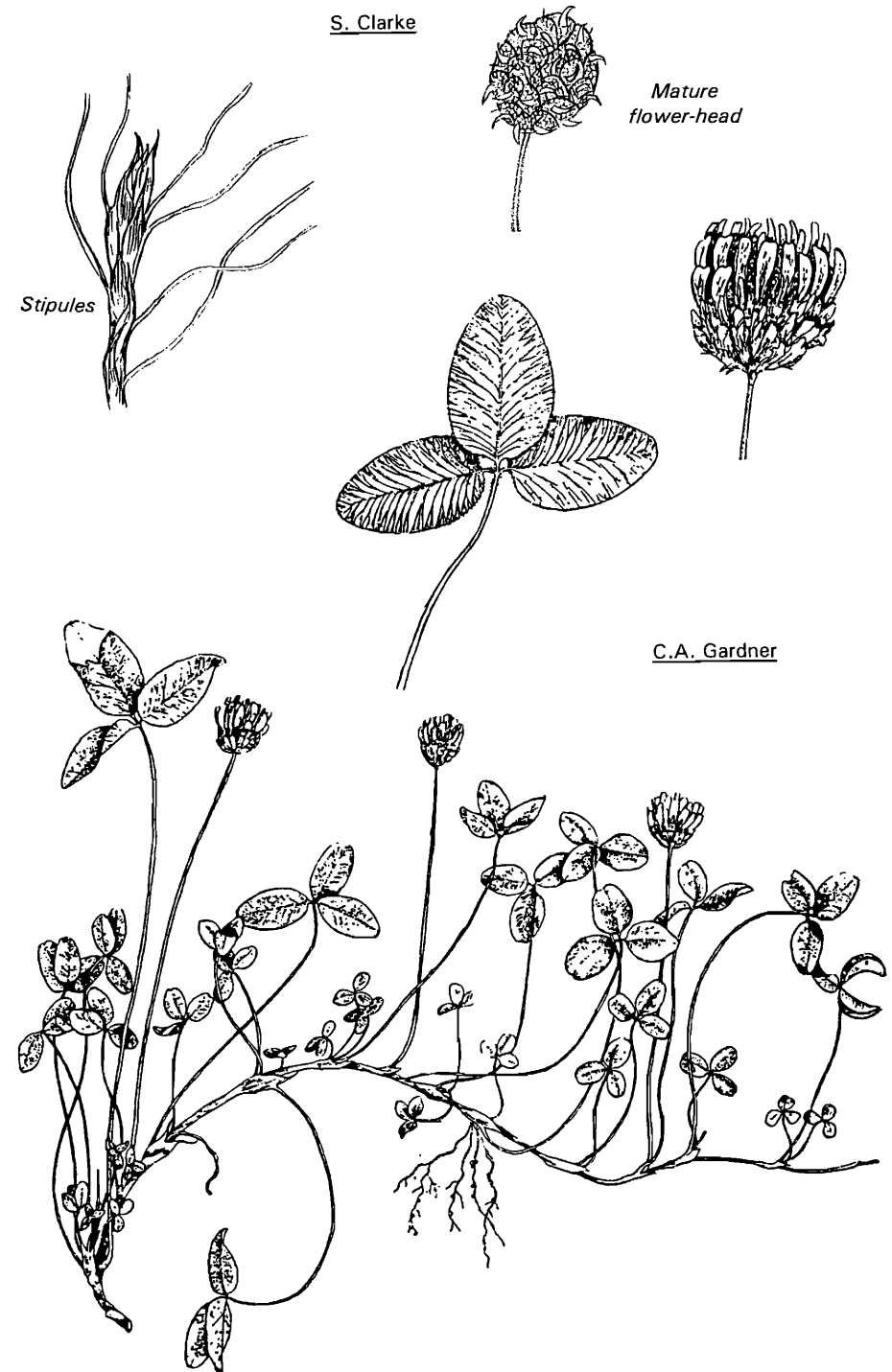
STRAWBERRY CLOVER*Perennial*

- Stoloniferous; puts down roots from stolons, thereby spreading in patches, like white clover.
- Leaflet shape is usually a narrow, pointed oval.
- Leaf veins are more curved, closer together and more branched than white clover.
- Appears hairless but a few hairs may be found on the leaf stems and the veins of the leaf back.
- Stipules are, relatively, much larger than those of white clover and have long drawn out points.

Flower-head

Globe shaped with many small white or pink flowers. It inflates at maturity, looking like a papery ball with bits sticking out (resembles a pink or brown strawberry).

Agronomic features....Long lived, deep rooted and tolerant of waterlogged and slightly saline soils....Prefers heavy soils with a high pH....Often tried in such conditions, when other legumes won't persist, but usually appears prostrate and lacking in bulk, especially inland....More vigorous stands are seen in high rainfall, coastal areas, such as the far North-West.



CAUCASIAN CLOVER*Perennial*

- Mostly hairless but there can be short hairs on the stems.
- Leaflets are pointy, have branched veins, fine teeth on the margins and large, white crescents on the face. Black speckles on the leaflets are a feature of cultivar Kuratas.
- Rhizomes form a spread out array of daughter plants.
- Growing points are underground so early leaves emerge straight from ground.
- Stipule is broad at the base and gradually tapers to a point.

Flower-head Round, large and prominent. White, changing to pink-purple. Flower-heads often remain prominent on the plants after dying off.

Agronomic features....Spring/summer active - in winter becomes dormant and dies off....New to Tasmania so not common yet....During establishment, Caucasian clover is slow growing and sensitive to overgrazing and competition....Once established is very persistent....Survives in drier areas...Not tolerant of salinity...Some tolerance to low pH, low phosphorous and flooding.



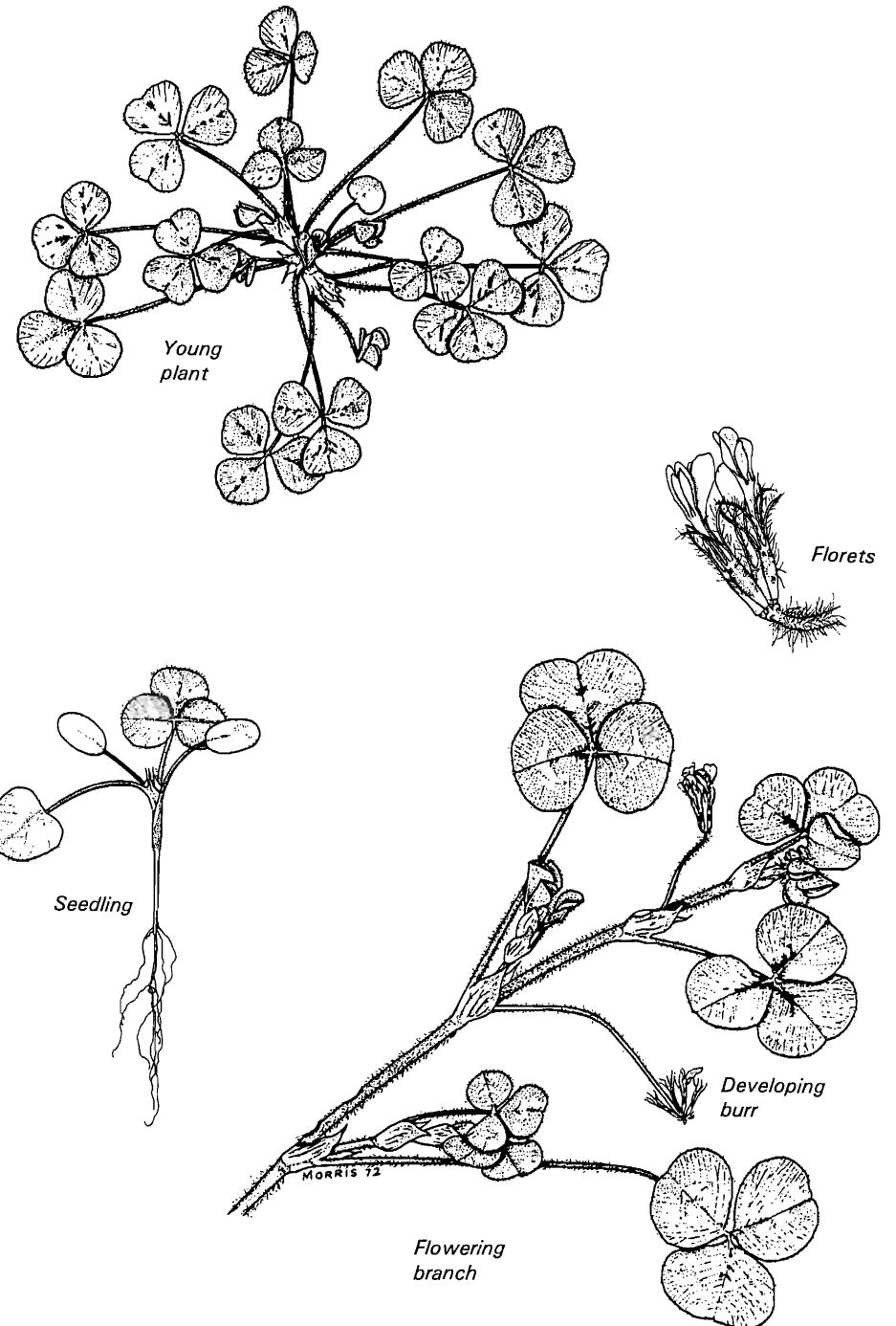
SUB. (Subterranean) CLOVER*Annual*

- Hairs on the leaflet margin and leaf back, at least, but many common cultivars have a thick covering of hairs all over.
- Looks dull and soft compared to white clover.
- Leaflets are round or heart shaped, with equal length stems; markings vary with the cultivar.
- Prostrate to semi-erect.
- Large seeds produce a large seedling.

Flower-head

From non-rooting prostrate stems, trailing stalks grow which end in groups of 3 or 4 white flowers (often with pink and red markings). These form a burr that turns downwards and buries the 3 to 4 large seeds.

Agronomic features....Effective germination begins with the autumn rain and the burr is buried about Christmas time....Persists and produces good quantities of forage and nitrogen in low rainfall areas where perennials will not survive dry summers....Perennials, like white clover, have the potential for greater production in high rainfall areas....The buried burr can provide feed for hungry sheep...



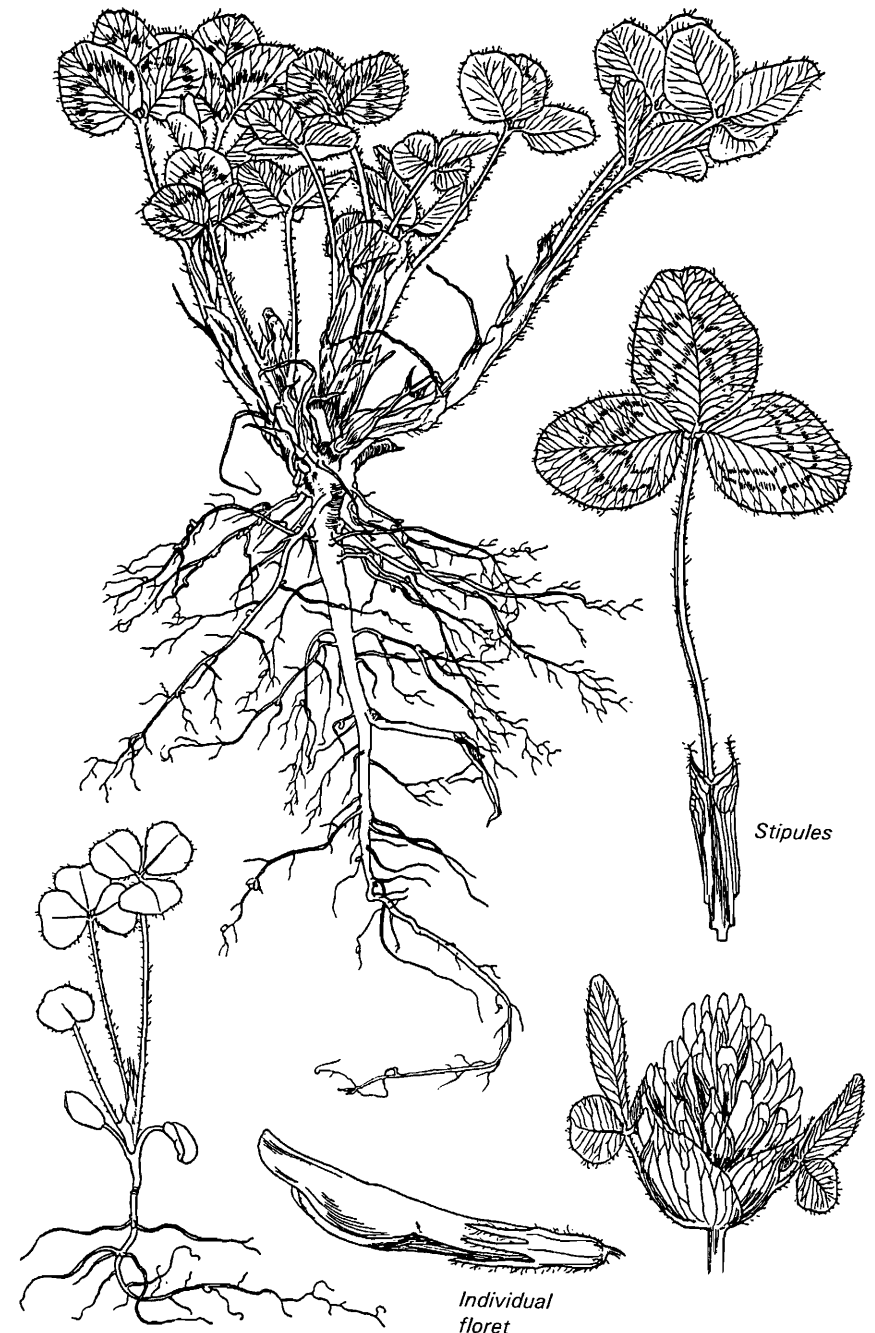
RED CLOVER (Cowgrass clover)*Biennial or short lived perennial*

- Erect with large, branched, stems arising from a crown with a strong taproot.
- Hairy.
- Large, thick, oval leaflets (although they can be smaller and round). With or without white crescent markings. Equal length leaflet stalks.
- There is a little tuft of hairs on the point of the conspicuously veined stipule. The veins are usually coloured red.

Flower-head Large, round, stalkless heads containing many pink-purple flowers.

Agronomic features....Used as a fodder crop rather than for permanent pasture....Lasts 2 to 4 years....Needs careful grazing management to avoid plant death....Prefers well drained, fertile soils.

Astred, a variety capable of surviving in permanent pasture has been developed in Tasmania. It has a less erect habit and has stolons so it is able to reproduce vegetatively.



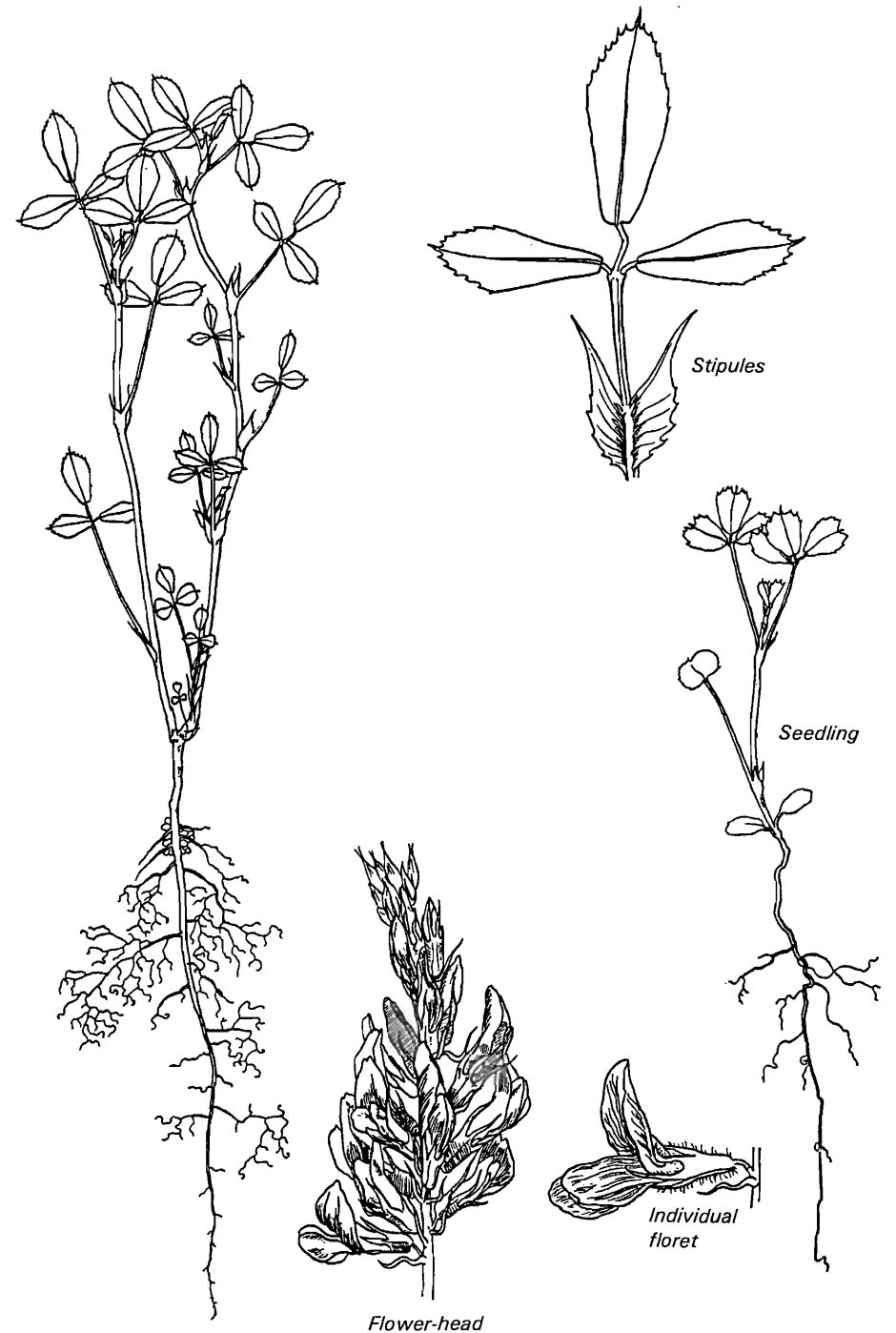
Medicago sativa
LUCERNE (Alfalfa)

Perennial

- Middle leaflet stalk is much longer, a feature common to all medic species.
- Leaflets have an oval~oblong shape, are without markings and the margins are toothed at the top. The mid-rib extends to form a tiny point.
- Hairy all over.
- The stipule has a long point and usually has large teeth on the margin.
- Stems are four cornered.
- Erect in growth habit.

Flower-head Purple cluster of flowers on stalks arranged along the stem.

Agronomic features....Often sown alone as a perennial cash (hay) or fodder crop but in some areas it is used in mixed swards....Very deep rooted....Likes fertile, well drained, neutral to alkaline soil....Exposed crown and so needs carefully controlled grazing management.



- 76 *Trifolium glomeratum* (Cluster clover, Ball cl.),
T. dubium ([Yellow] Suckling clover) or
T. campestre (Hop clover).

SMALL LEAF ANNUAL CLOVERS

Annual

- Annual and small leaved. Suckling has hairs, hop may have hairs and cluster doesn't.
- Suckling and hop clovers break the clover rule by having a slightly longer central leaflet stalk.
- All have toothed leaflet margins. The leaflet veins have relatively few branches.

Flower-head Cluster clover has a green ball with pink petals poking out and suckling and hop have small groups of yellow flowers.

Agronomic features....Not usually sown in Tasmania. These small clovers make a significant contribution to lower producing unimproved or natural pastures, but in comparison to clovers such as sub. and white, are not usually very important in improved pastures. These species are sometimes called trefoils. 'Trefoil' is also applied to medics in some districts and the lotus species are often called bird's-foot trefoils.

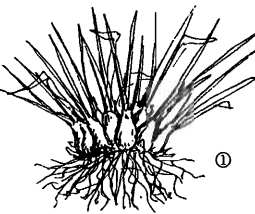


Suckling Clover (*Trifolium dubium*).

Clustered Clover (*Trifolium glomeratum*).

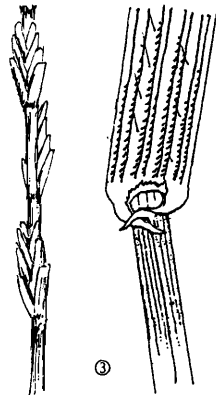
Some other species

(of interest but not quite worth a full description)



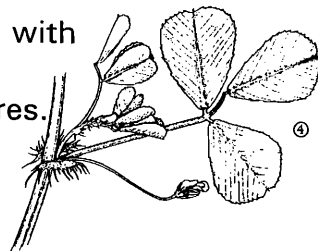
Poa bulbosa Hairless. Short, narrow, folded leaves arise from bulbs during winter. The bulbs are on or near the surface. The plants remain short with very little growth. Auricles absent. Found in dry areas of the midlands.

Aira species A very small annual with a large ligule and a light, loose spreading panicle. Found in poor, dry soils.

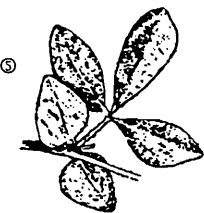


Tall wheat grass *Elymus elongatus* Like tall fescue but is coarser, more deeply ribbed and darker and may have scattered hairs. It has large auricles which do not have short bristles, as tall fescue's auricles do. The ligule is not obvious. The seedhead is a spike with large awnless spikelets recessed into the stem like an over-size ryegrass. Uncommon, but it is tolerant of salinity and so it may be sown into saline areas.

Medics *Medicago species*. Trifoliate leaves with a much longer central leaflet stalk. Smaller leaved species are sometimes seen in pastures. The larger leaved species are seen mainly in un-grazed areas. Lucerne is the only medic that is commonly sown in Tasmania.



Lotus species The central leaflet stalk is longer (but usually not much longer) and the stipules look like leaflets making it appear to have five leaflets rather than the usual three on clovers and medics. Few veins on the leaflets.



Tom Priestley ① & ③, J. Sampson-Tucker ②, D. I. Morris ④, C.A. Gardner ⑤

Further reading

'A Guide to Better Pastures in Temperate Climates'. MV O'Reilly, DW Brouwer and RL Ison. Re-published 2002 by NSW Ag. (Focused on species and varieties. Some advice on management. Good to read with colour photos).

'Clovers & Allied Species'. A Morgan. Agriculture Victoria. 1965 (Still a very good booklet. Wide range of species. To the point and readable. Lots of illustrations).

'Common Grasses of Tasmania - An Agriculturalists Guide' Tasmanian Environment Centre 1999 (Includes 38 species of grass (no legumes). Drawings & colour photos.)

DPI Victoria, website. www.dpi.vic.gov.au. (Information related to southern areas of Victoria applies well in Tas.)

'Farmpoint' website. Maintained by DPIPWE Tas. (Has pasture related web pages and links to relevant sites.)

'Grasses of Temperate Australia, A Field Guide'. CA Lamp, SJ Forbes, JW Cade (Illustrations by AG Barnett, DI Morris and J Sampson-Tucker) Re-published by Bloomings Books 2001 (Descriptions are thorough and therefore not simple. Otherwise the text is readable and interesting with great illustrations. Over 100 species).

'Greener Pastures for South West Victoria'. Written by Pasture and Soil Specialists of the Department of Primary Industries, Victoria. 1997. (Excellent and comprehensive but concise information on pasture management which relates well to some areas of Tasmania)

Meat and Livestock Australia (MLA) has a range of pasture management related publications. Phone 1800 675 717 or www.mla.com.au

'Native Grasses – An Identification Handbook for Temperate Australia'. 'Meridith Mitchell, Landlink press CSIRO 2002 (*17 species, excellent colour photos and simple but informative text including information on native pasture management*). www.landlinks.csiro.au

'Pasture Legumes for Temperate Farming Systems. The Ute Guide' Primary Industries and Resources SA and GRDC. 2004 (*Covers most available legumes. Colour and waterproof construction*).

'Species for Profit. A guide for Tasmanian Pastures and Field Crops' DPIWE Tas. 2006. (*Presents the knowledge of DPIPWE and TIAR agronomists. Assists farmers choose the best species and cultivars for their specific site within the Tasmanian environment. Includes pastures, forage crops and cash crops*). Available from DPIPWE free.

'Tasmanian Weed Handbook' B Hyde-Wyatt and DI Morris. DPIPWE Tas. 1975. (*Covers the main broad-leaf weeds of crops and pastures in Tasmania. An excellent, functional book with superb drawings. To be re-published soon by DPIPWE Tas. with environmental weeds and some colour pictures.*)

'The Student's Flora of Tasmania, Part 4B'. WM Curtis and DI Morris. St. David's Park Publishing 1994. (*Includes most Tasmanian grasses. Handy for checking details but difficult to read without expertise in taxonomy*).