



GRASSES (Poaceae)



Did you know that,

- Grass pollen first appeared in fossil record 50 million years ago, at the start of the Eocene period. They are thought to have evolved alongside grazing mammals.
- Poaceae is one of the most diverse and abundant plant groups. Worldwide it contains 700 genera and 10,000 species. In Australia there are 220 genera and 1,230 species. 30% are introduced.
- They are adapted to a wide range of habitats from alpine to warm tropical savannah regions where there is plenty of sun, moisture and warmth.

The Importance of Grasses

They are of great economic importance and have made human civilization possible.

- It is estimated that grasses supply 60% of the world's food.
- All of the cereal grains: wheat, rice, maize, oats, barley, rye, sorghum and millet are grasses. The meat, poultry, dairy and wool growing industries depend on grazing or cereals.
- Sugar cane and bamboo are grasses.
- Grasses form the basis of natural ecosystems such as grasslands.

Why are grasses so successful?

- They produce large quantities of seed which are spread by wind, water and animals.

Some have hooks, hairs or awns to facilitate this.

- They can survive adverse conditions by reproducing vegetatively from buds on underground stems. This enables survival from drought and fire.
- They are wind pollinated and produce large quantities of pollen. The flowers are small, green and inconspicuous as they do not need to attract pollinators.

Grasses are Monocotyledons

These are herbaceous plants which have one seed leaf (cotyledon), strap-like leaves with parallel veins, a fibrous root system and usually no woody material.

What is a grass?

Grasses can be confused with other plant groups such as sedges and rushes, which have a grass-like appearance. Grasses can be identified by a combination of features such as an open leaf-sheath which encircles the stem, and a ligule.

Growth Habits

Grasses may grow in

Tufts or tussocks, - where the leafy shoots or **tillers** are joined at the base by a short stem.

Mats, - where leafy shoots grow from branched horizontal stems.

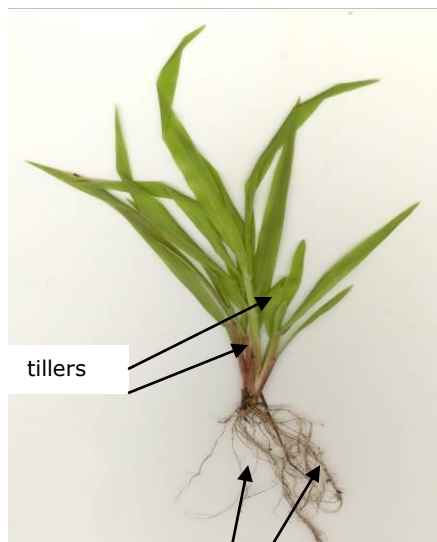
If the stem runs along the surface of the soil, it is a **stolon** or runner .eg. Buffalo grass.

If the stem is below the surface of the soil, it is a **rhizome**. Kikuyu and Couch have both stolons and rhizomes.

Both stolons and rhizomes can form adventitious roots at the nodes.

Decumbent grasses have stems which grow horizontally and then turn upwards.

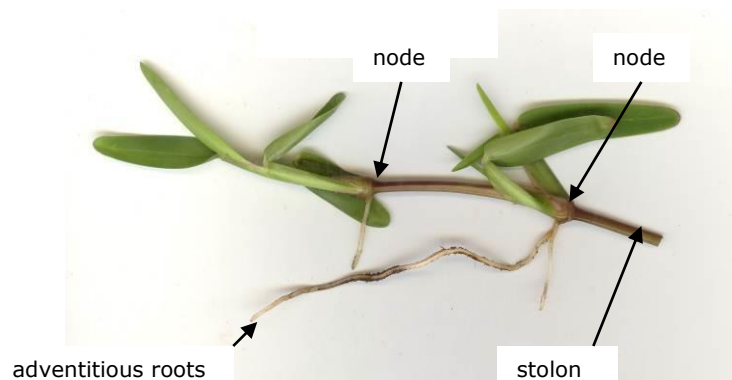
Tufted Grass



tillers

fibrous root system

Mat Grass



node

node

adventitious roots

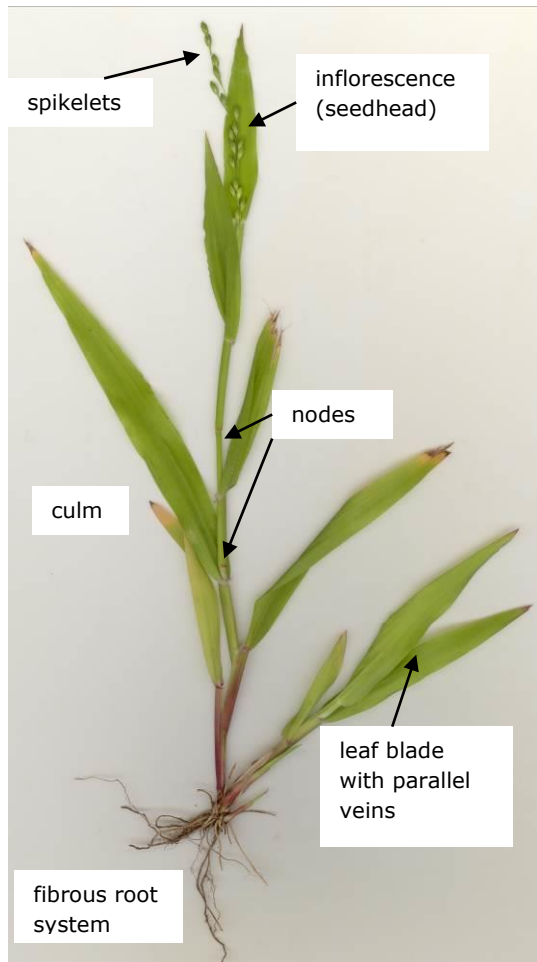
stolon

rhizome



Grass Plant Structure

The Grass Plant

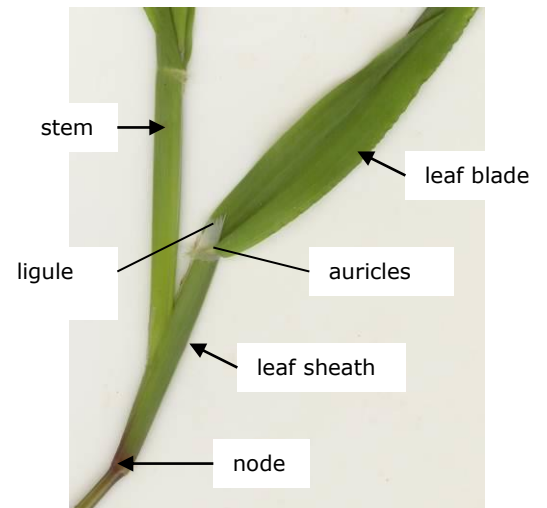


Culms are the upright stems of grass tillers.

They are solid at the joints or **nodes** and hollow between the nodes. The part of the stem between two adjacent nodes is the **internode**.

Grasses are **herbaceous** and lack woody tissue. There are exceptions such as bamboo.

The Grass Leaf



Leaves arise at the nodes.

Leaves have:

- **a leaf blade** or lamina with parallel veins.
- **an open leaf sheath** that encircles the stem.
- **a ligule** that can be a membranous flap or a rim of hairs.
- **auricles** that are earlike flaps.

Inflorescences

The inflorescence or flowerhead /seedhead consists of a number of spikelets. Spikelets are either sessile (attached directly to the branch) or on stalks or **pedicels**. The central axis is the **rachis** and the stem below is the **peduncle**.

Types of Inflorescences

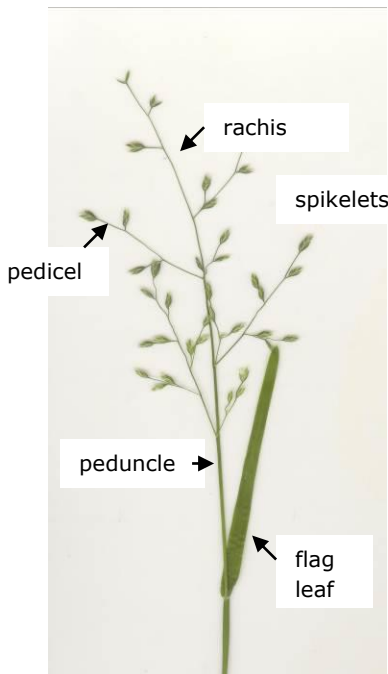
A Panicle is a much-branched inflorescence. This is the most common type.

A Spike has spikelets directly attached to the rachis.

A Raceme has spikelets attached to the rachis by a short stalk.

Digitate has racemes or spikes arranged like fingers of a hand.

A Spathe has leaf like bracts in the seedhead.



open panicle (*Poa*)



spike (*Lolium*)



racemes on primary axis
(*Paspalum*)



digitate (*Chloris*)



subdigitate (*Eleusine*)



spathe (*Themeda*)

Structure of a Spikelet

A **spikelet** consists of a number of **florets** arranged alternately on a central axis, the **rachilla** above 2 empty bracts, the **glumes**.

Each floret consists of 2 bracts: the **lemma** and **palea**, which surround the grass flower.

The **grass flower** consists of usually 3 pendulous **stamens**, two feathery **stigmas** to collect wind born pollen, an **ovary** and two **lodicules**. Lodicules assist in the opening of the floret. After pollination, a **grain** or **caryopsis** develops.

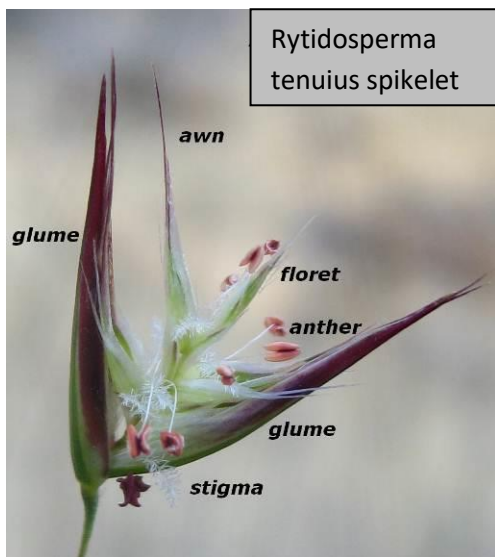
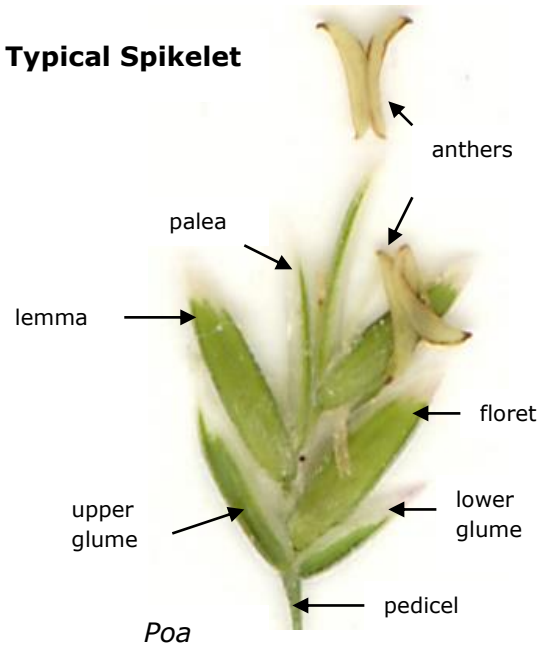


Photo: Wendy Grimm

A Typical Spikelet



Find the spikelet(s), glumes and florets.



Echinopogon



Eragrostis



Paspalum



Avena

Some Native Grasses found in the Ku-ring-gai Wildflower Garden

Grasses botanical signs in KWG have '27' on a green disc attached to the sign.

[Anisopogon avenaceus](#)

Common Name: Oat Spear Grass

Habit: Erect, tufted grass to 1.5m.

Habitat: Dry Forests, sandy soils.

Flowering: Spring

Distinguishing Features:

- Loose panicle with large nodding flowerheads.
- Large spikelets have one long and two short bristles.

Indigenous to KWG



[Aristida vagans](#)

Common Name: Threeawn Speargrass

Habit: Wiry tufted grass to 80 cm.

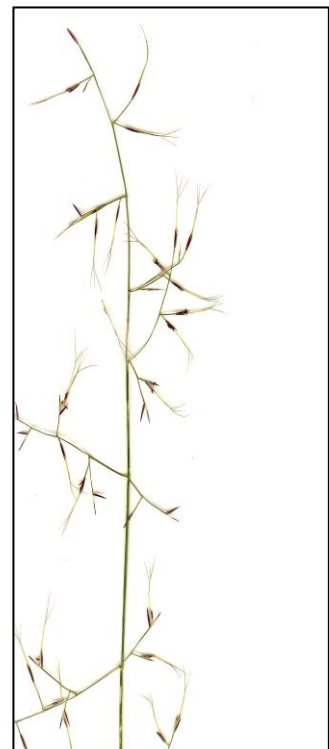
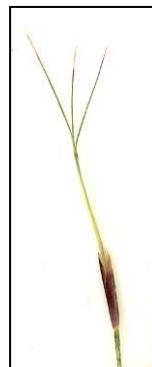
Habitat: Open-forest on ridges, slopes. Clay soil.

Flowering: Summer-autumn

Distinguishing Features:

- Spreading branched panicle
- Spikelets have florets with a three-branched awn.

Indigenous to KWG



Rytidosperma tenuius

Common Name: Wallaby Grass

Habit: Slender tufted grass to 70m.

Habitat: Open-forest on ridges. Sandy to clay soil.

Flowering: October to May.

Distinguishing Features:

- Margins of spikelets are tinged with purple.
- Mature spikelets have tufts of white hairs which give the seedhead a fluffy top.
- The floret has a single awn between the lobes of the lemma.

Indigenous to KWG



Austrostipa pubescens

Common Name: Tall Spear Grass

Habit: Tufted grass to 1.5 m

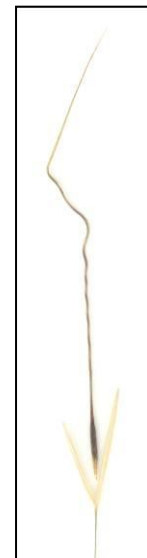
Habitat: Open-Forest. Sandy soil.

Flowering: Spring

Distinguishing Features:

- The flowerhead is a loose open panicle.
- Numerous single spikelets on slender stalks.
- Seeds have a long twisted awn like a corkscrew.
- Nodes purplish, covered with short, soft hairs.

Indigenous to KWG



Cymbopogon refractus

Common Name: Barbed Wire Grass

Habit: Tall, tufted grass to 1m.

Habitat: Open-forests, hillsides. Clay to loamy soils.

Flowering: December-March

Distinguishing features:

- Rigid pale red stems with blue-green leaves.
- Leaves aromatic when crushed.
- The down turned branches of spikelets resemble the points of barbed wire.
- The inflorescence is a spathe.



Planted in KWG

Entolasia stricta

Common Name: Wiry Panic

Habit: Straggling tufted grass to 80cm

Habitat: Open-forest, hillsides and ridges on sandy soil.

Flowering: October-May

Distinguishing Features:

- Short leaves at right angles to the stem.
- Often a leafy tuft at nodes.
- Spikelets on short branches close to the stem.



Indigenous to KWG

Eragrostis brownii

Common Name: Brown's Love Grass

Habit: Tufted grass to 60cm.

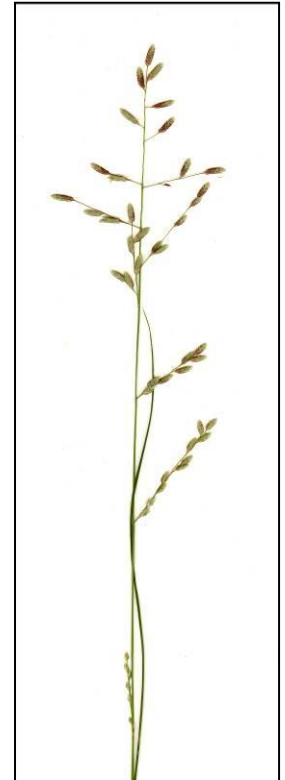
Habitat: Open heath on ridges, hillsides.
Sandy soil.

Flowering: Summer.

Distinguishing Features:

- Seedhead is an open or compact panicle.
- Spikelets have short pedicels or are sessile
- Spikelets are tinged with purple.
- Spikelets are linear with many florets.
- Inflorescence narrow-more than twice as long as broad.

Indigenous to KWG



Imperata cylindrica

Common Name: Blady Grass

Habit: A tufted rhizomatous grass to 1.2m.

Habitat: Moist open forest on ridges, slopes.

Deep sandy loam. Disturbed areas.

Flowering: November-March

Distinguishing Features:

- The leaf blade narrows to the width of the midrib.
- Fluffy cylindrical seedhead.
- Spikelets surrounded by fine, long, white hairs.
- Vigorous branching rhizome produces many shoots.

Indigenous to KWG



Microlaena stipoides

Common Name: Weeping Grass

Habit: Tufted grass to 0.7m with a short rhizome.

Habitat: Moist eucalypt forest. Sandy and clay loam.

Flowering: Spring to autumn.

Distinguishing Features:

- Narrow weeping seedhead.
- Spikelets have long straight bristles.
- Often has a constriction near the tip of the leaf.

Indigenous to KWG



Panicum simile

Common Name: Two-colour panic

Habit: Slender tufted grass to 50 cm.

Habitat: Open-forest on hillsides and ridges.
that have clayey soils.

Flowering: December to March.

Distinguishing Features:

- Open panicle with slightly zigzag branches.
- Pairs of spikelets at end of branches.
- Spikelets are pale or purple.

Indigenous to KWG



Paspalidium distans

Habit: Low growing tufted grass to 70 cm.

Habitat: Woodland. Sandy and clay soils.

Flowering: October to April.

Distinguishing Features:

- Narrow seedhead.
- The seedhead has short 1-sided racemes spaced along the main axis.
- Branches of the inflorescence end in a very small bristle-like point.

Indigenous to KWG



Poa affinis

Habit: Tufted grass to 1.2 m.

Habitat: Creek banks, open forest and sheltered sites on shale or sandstone.

Flowering: Spring to summer.

Distinguishing Features:

- Soft green leaves, rough on lower surface.
- Open spreading panicle.
- Spikelets have several florets.
- Florets have a web of loose hairs between them.



Indigenous to KWG

Poa labillardierei

Common Name: Tussock

Habit: Coarse densely tufted grass to 1.2 m.

Habitat: Creeks, gullies, open-forest on clay soils from shale or alluvium.

Flowering: Spring

Distinguishing Features:

- Leaf blades are rough, greyish green to 30cm.
- At maturity the inflorescence forms a large spreading panicle about 20cm long.
- Each spikelet contains hairy florets.

Planted in KWG



Themeda australis

Common Name: Kangaroo Grass

Habit: Tufted grass to 1m.

Habitat: Grasslands and grassy woodlands on sandy to heavy clay soils.

Flowering: Summer.

Distinguishing Features:

- Light green leaves and seedheads turn a copper colour on maturity.
- Seeds have long dark awns.
- Culms have dark nodes.
- Seedheads consist of a number of spathes.

Planted in KWG



FURTHER INFORMATION

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PlantNET

[Hornsby Online Herbarium](#)

ACKNOWLEDGEMENTS

These notes may contain hyperlinks to materials, including images, illustrations, plant descriptions and a glossary from PlantNET, with the courtesy of The Royal Botanic Gardens & Domain Trust, 2021.

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