

GRASSES: *Native & Exotic* in the Hornsby Shire



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Introduction

With over 100 species of native and naturalised exotic grasses occurring across the Hornsby Shire accurate identification can prove both difficult and frustrating.

The scope of this document is to provide the reader with easy to use descriptions and photographs of selected grasses to showcase key-identifying features.

The document includes 15 common native grasses as well as 18 exotic grasses that have naturalised across the Hornsby Shire. Descriptions include details on typical occurrences, habitats, control methods and propagation.

As we experience an increasingly variable climate, it is important to bear in mind that this has effects on the growing conditions for grasses. Wetter years may favour the growth and reproduction of moisture loving species, while drier years may see an absence of these species in all but the wettest corners and drought adapted species may instead flourish. Environmental conditions may also affect the growth habit of grasses, in particular their appearance. Height, spread and the amount of flowering/seeding can be drastically affected. It is important to bear this in mind when attempting to positively identify a species.

Consideration must also be given to the time of year, many grasses strictly grow in either summer time or winter (known as C4 or C3 grasses respectively, see p33).

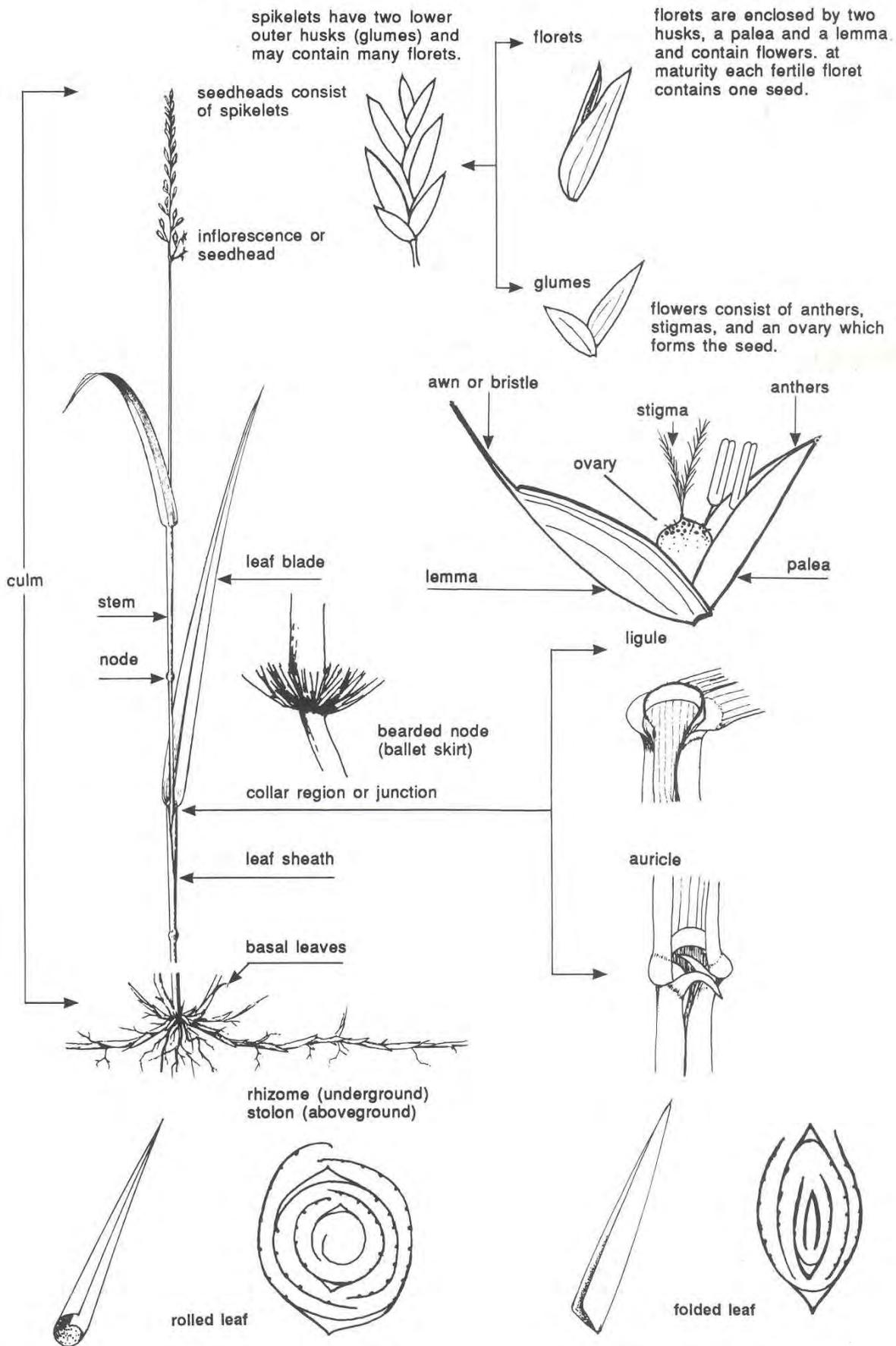
Control methods listed in the notes attempt to cover real life situations where total control is not always possible, instead minimising the impacts of an exotic grass may be the only option at a given point in time. The most obvious example being the hasty collection of the current seasons seed production to prevent further spread.

Exotic grasses thrive in areas such as roadsides and bushland edges and are quick to colonise freshly disturbed areas. When attempting to control an exotic grass, it is important to manage the task within your limits. Over clearing may just result in another species of exotic grass moving into the disturbed area. Since many of the introduced grasses are annuals and grow over warmer months, undertaking works in cooler months and encouraging the growth of beneficial native species during this timeframe may be the best option.

Identification can be aided by creating a collection of dried pressed specimens. It can be a long time between seeing a species in the field one season and remembering its attributes until the same time the following year.

Ross Rapmund, July 2013

Grass terminology



Lodge, G.M., Robinson, G.G., Simpson, P.C. 1990, Agfacts P2.5.32 *Grasses- native and naturalised*. NSW Agriculture

Native species

Genus:

Aristida

Common Name:

Three Awned Spear Grass /
Purple Wiregrass

Species:

ramosa

Derivative of species name:

Twiggy

Description:

Small tufted perennial grass. Slender in all appearances. Mostly around 50cm in height. Wiry inconspicuous leaves and wiry stems are produced in small amounts after favourable rainfall. Husks on seeds have a purplish appearance. The seedhead is a panicle. Individual seeds within the seedhead are highly distinctive since they each hold three awns.

Occurrence:

Chiefly on clay soils, in full sun. Common on roadside verges with natural soil profiles, also in open forest or woodland remnants on clay or heavier soils. May persist in paddocks with low grazing levels or around the base of isolated old remnant trees across the landscape. Several other *Aristida* spp. occur in Hornsby Shire.



Comments:

Low nutrient value for stock. Decreases with grazing. Seeds can be troublesome to livestock as a contaminant in fleece. Propagate by seed sown in the following warm season after collection. Re-sprouts well after fire. C4 perennial grass.

Size: 50cm (up to 1m)

Flowering: Spring-Autumn

Seeding: Summer-Winter

Native species

Genus:

Austrostipa (syn. *Stipa*)

Common Name:

Tall Spear Grass

Species:

pubescens

Derivative of species name:

Softly hairy

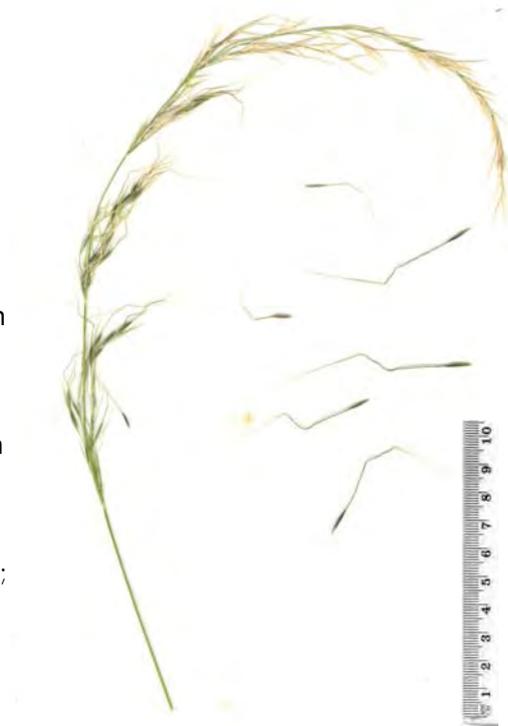
Description:

A tufted perennial grass to 1.2m tall when flowering/seeding. Upper surface of leaves are rough to touch and coarse in texture. Robust flowering stems produce seeds with a distinctive mildly corkscrew shaped long awn. The seed itself is quite large, dark in colour and approximately 1cm in length. The seeds are finely covered in short hairs and have a very sharp point.

Occurrence:

Chiefly clay soils and associated vegetation (open forest-woodland), but also on sandstone ridgetops which may have some clay influence and hence extra nutrients. Common on roadside verges with natural soil profiles. Grows in full sun to part shade.

Austrostipa ramosissima, (Native Bamboo Grass) also occurs in the HSC locality. It is less common; preferring shady and sheltered locations. It has high ornamental value.

**Comments:**

A long lived grass. It can resprout well after fire disturbance. Grazed by rabbits. Seeds can be troublesome to stock hence the common name. Propagate by seed sown in the following warm season after collection. Larger tufts can also be divided successfully. C3 perennial grass.

Size: Up to 1.2m

Flowering: Spring

Seeding: Early summer

Native species

Genus:

Austrodanthonia (Syn. *Danthonia*)
Now known as *Rytidosperma tenuior*

Species:

tenuior

Common Name:

Wallaby Grass

Derivative of species name:

Thin

Description:

A small tufted perennial grass generally under 50 cm in total height. Very hardy. Fluffy seed heads are distinctive, along with the pale straw to whitish coloured seed head. "Danthonias" are difficult to identify down to a species level. The arrangement, length and shape of the hairs on the seeds are needed for correct I.D.

Occurrence:

Very widespread across the HSC locality. Chiefly more on clay soils in full sun but also sporadically occurring in sandstone areas where there is good light. Several species of *Austrodanthonia* occur across Hornsby Shire.



Comments:

Wallaby grasses are highly valued for their pasture importance. They respond well to grazing, are high in nutrient value and are drought tolerant. Re-sprouts well after fire. They also have good ornamental value when planted in large groups. Propagation by fresh seed or hold the seed in storage for up to 2 to 3 seasons. Other Danthonias may require to be held over to the next warm season for germination post collection. C3 perennial grass.

Wallaby Grasses have gone through some major botanical revision recently, as such refer to the Royal Botanic Gardens website (NSW Flora Online) for the latest information and up to date name changes.

Size: Up to 50 cm

Flowering: Mainly Spring (or after disturbance)

Seeding: 4 months after flowering

Native species

Genus:

Bothriochloa

Common Name:

Red Leg Grass/Red Grass

Species:

macra

Derivative of species name:

May refer to its often seasonal conspicuous abundance in the landscape where it can dominate.

Description:

A warm season tufted perennial grass. Growth is from a very low tuft almost prostrate from which several wiry stems arise. It is these stems that are red or dark purple (after cooler weather) in colour from which the common name arises. The two branched, up to four branched, seedhead is closely held together giving the impression of a single unbranched seedhead. Individual seeds are quite hairy which on the entire seedhead are quite distinctive.

Occurrence:

Very common in late summer when it grows abundantly. Favours areas of disturbance in open sunny positions chiefly on clay soils. Locally common on road verges, unkempt nature strips or in paddocks. Withstands mowing which done in late summer further encourages more flowering/seed set.

**Comments:**

Propagation is best by seed sown in the following warm season after collection. An important pasture species for stock due to its tenacious habit and ability to grow well in adverse conditions, palatability and forage quality rapidly decrease after seedhead initiation however. C4 perennial grass. A useful coloniser for reintroduction after weed removal. Possible use as a native lawn alternative.

Size: Up to 0.5m (stems of seedheads only).
Foliage prostrate.

Flowering: Summer to early autumn

Seeding: Late summer through autumn

Native species

Genus:

Cymbopogon

Common Name:

Barbed Wire Grass

Species:

refractus

Derivative of species name:

Bent backwards, reflexed

Description:

A sprawling tufted perennial grass. Aromatic foliage when crushed– lemon scented. Highly distinctive seedheads which become reflexed upon maturity, hence the common name between forward facing unripe seeds and ripe bent seeds held on the same inflorescence. Stems are usually pale red in colour which contrasts well with the greyish green leaves. Stems with seedheads also droop upon maturity.



Occurrence:

Low nutrient soils, either full sun or part shade. Sporadic occurrence across the HSC locality. In open forest on either clay or sandstone soils.

Comments:

Closely related to Asian Lemon Grass (*Cymbopogon citratus*). Very drought hardy. Can become “weedy” in a garden situation under favourable conditions, although it is very ornamental in a landscaped scenario. Low nutrient value for stock, decreases if grazed. Easily propagated from fresh seed. C4 perennial grass.
Confusing species: Coolatai grass P28.

Size: Up to 1m

Flowering: Warmer months

Seeding: Warmer months

Native species

Genus:

Dichelachne

Common Name:

Short Haired Plume Grass

Species:

micranthra

Derivative of species name:

Small flowered

Description:

A narrow tufted perennial grass growing to 1m in height with seed heads. The plant usually contains few stems, generally in direct correlation with environmental factors. Pale coloured seed heads are also narrow and up to 15cm in length. The densely arranged seeds each contain a silky awn which gives rise to the common name.

Occurrence:

Generally on higher nutrient soils in moist open forest tolerating part shade. Also sporadically occurring on sandstone soils. It is common on roadside verges or forgotten corners where mowers don't reach.

Dichelachne crinata (Long Haired Plume Grass) can also be found across the HSC locality particularly near estuaries. It has a more robust appearance, long silky seedheads and high ornamental value.



D. crinata

D. micranthra

Comments:

Easily overlooked when distinctive seedheads are not present. Moderate drought resilience once established. Colonises disturbed areas, responding well to fire. Good stands can be seen in Observatory Park (corner of Beecroft and Pennant Hills Roads.) C3 perennial grass.

Size: Up to 1m

Flowering: Spring or often after favourable rain at any time of the year.

Seeding: Early summer usually.

Native species

Genus:

Digitaria

Common Name:

Native Summer Grass
Finger Grass

Species:

parviflora

Derivative of species name:

Small Flowered

ramularis

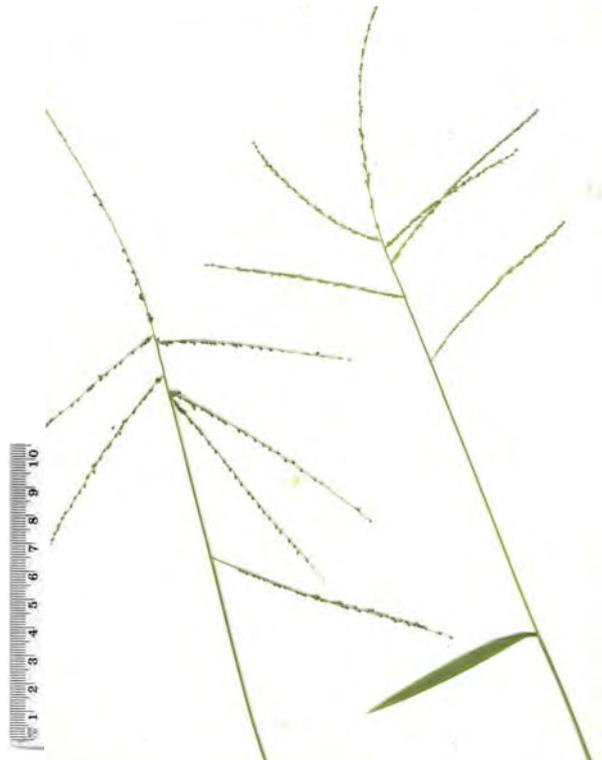
Having numerous small branches

Description:

An open weakly sprawling tufted grass which is a perennial. Often not visible in cooler months, most growth occurs in warmer months. Seedheads are often held on long stems. The seedhead itself is open and delicate in appearance with tiny seeds arranged along one side of the branches. The overall shape of the seedhead is that of a Christmas tree.

Occurrence:

Uncommon and easily overlooked. Can be easily mistaken as weed grass, particularly introduced annual summer grass. A plant of moist open forests on either clay or enriched sandy soils with a higher nutrient value.



Digitaria parviflora

Comments:

Propagation is by seed sown in the following warm season after collection. Seeds are reported to be eaten by finches. C4 perennial grass.
Confusing species: Summer grass P25, which has a prostrate creeping habit in comparison.

Size: Up to 1.2m

Flowering: Mid summer

Seeding: Late summer

Native species

Genus:

Echinopogon

Common Name:

Tufted Hedgehog Grass &
Forest Hedgehog Grass
(Echidna Grass)

Species:

caespitosus

Derivative of species name:

Tufted

ovatus

Oval shaped

Description:

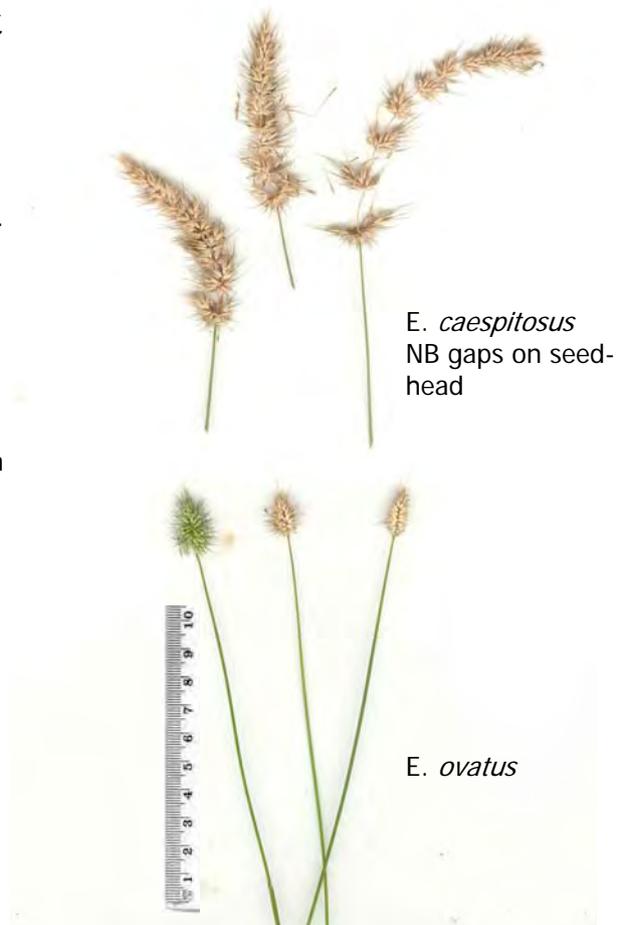
Distinctive low growing grasses of moist areas. *E. caespitosus* is the larger of the two with distinctive separated sections that make up the oval shaped seedhead. *E. ovatus* is smaller in habit, its distinctive seedhead compressed and unbroken in one singular oval shape. Both species have rough stems when rubbed upwards. Both are perennial species, *E. caespitosus* growing in tufts and *E. ovatus* grows via stolons.

Occurrence:

Mainly on higher nutrient clay soils. Also common in sheltered moist conditions on sandstone soils, for example, creeklines and valleys.

Comments:

The rough nature of the stems allow the plant to "scramble" above other vegetation. Propagated easily by seed, sow the following autumn after collection. C3 perennial grass.



Size: Up to 1m

Flowering: August to May,
Chiefly summer

Seeding: nearly all year, peak
in summer

Native species

Genus:

Eragrostis

Common Name:

Native Love Grasses

Species:

Several local ones. The most common are;
benthamii and *brownii*

Derivative of species name:

benthamii - After George Bentham

brownii - After Robert Brown

Description:

A small but wide (due to flattened leaves) tufted perennial grass, foliage quite low in height but seed-heads held up to 50cm in height. Seedheads are very open in arrangement, there are no awns on the seeds and they range from dull green to purplish in colour. The branches come off the main stem at right angles. On close inspection you will notice the heavily overlapping arrangement of the individual spikelets along these branches, sub branches are often mildly zigzagged in appearance.

E. benthamii generally has wider leaf blades and a larger seedhead than *E. brownii*.

Occurrence:

Widespread across the Hornsby Shire on either clay or sandy soils in strong light. A quick coloniser post disturbance particularly after clearing.



E. benthamii



E. brownii

Comments:

Propagation is by seed sown in the following warm season after collection. Seeds are probably eaten by birds. C4 perennial grass.

Confusing species: *Poa* spp. P21.

Size: Up to 0.6m (seed heads only)

Flowering: Spring to autumn

Seeding: Summer to early winter

Native species

Genus:

Entolasia

Common Name:

Right Angle Grass &
Wiry Panic

Species:

marginata

Derivative of species name:

Drawing attention to the leaf margin

stricta

Bundled

Description:

E. marginata is a lush dark green scrambling grass able to spread by rhizomes. Relatively broad leaves are held at right angles from the stems and have a distinctive mid-vein. They are over 5cm in length.

E. stricta is more wiry and finer in habit than *E. marginata*. The leaves are shorter and inrolled upon themselves, generally under 5cm in length.

E. marginata commonly has a branched flowering seedhead whilst that of *E. stricta* is usually unbranched. Seeds lack awns.

Occurrence:

E. marginata prefers the moister forested areas on clay soils or sheltered locations on sandy soils in valleys or along creeklines.

E. stricta is found in drier areas of woodland in full sun often amongst rocks or the bases of trees. Plants are long lived and often persists where mowers can't reach around the bottom of trees in cleared areas.



E. stricta

E. marginata

Comments:

Propagation is difficult since assessment of ripe seed is not simple and ripening of individual seeds on each seed head is not synchronous. Seed provides good feed for many seed eating birds such as parrots and finches. Easily grazed out in paddocks. Likely C3-C4 intermediate perennial grass.

Size: Up to 1m across for *E. marginata*. *E. stricta* is more upright to 1m+

Flowering: Occasionally all year but mainly warmer months

Seeding: Chiefly warmer months

Native species

Genus:

Imperata

Common Name:

Blady Grass

Species:

cylindrica

Derivative of species name:

Cylindrical

Description:

A densely growing rhizomatous grass capable of covering large areas. It thrives on disturbance. The flat leaf has tiny teeth along its margins. Leaf blades are rolled in bud. Cylindrical seed heads are very "fluffy" in appearance almost like cotton wool, white and silky. Extremely tough and hardy species of grass.

Occurrence:

Very common across the HSC locality. Particularly in disturbed sites such as roadside verges (from slashing) and areas subjected to over frequent fire regimes. Reaches its best development in full sun and in deep soils where the rhizome can spread more easily. Less common in shady situations.

**Comments:**

Found across Asia and Papua New Guinea the leaves are used for thatching in roofing. (Called "Kunai" in PNG). Can be difficult to grow from seed, if desired it can be transplanted by digging up the deep rhizome. Tends to only flower after heavy disturbance such as fire or slashing. It has poor value as fodder, only the young softer growth after slashing or fire is palatable to stock. Does provide a food source for many species of butterfly larvae. Excellent buffer/edge plant between disturbed weedy areas and bushland. C4 perennial grass.

Size: Up to 1m

Flowering: Warmer months
post fire or slashing

Seeding: 3-5 months after
flowering, generally autumn

Native species

Genus:

Lachnagrostis

Common Name:

Blown Grass

Species:

filiformis

Derivative of species name:

Thread like

Syn. *Agrostis avenacea*

Description:

The only native annual grass (occasional perennial to 3 years) in Hornsby Shire. Generally germinates in autumn, growing over the cooler months then flowers in spring, shedding seed in early summer before browning off. The distinctive seedheads are very light and brittle. They break off easily when ripe and blow around the landscape spreading seeds as they roll along. They are typically straw coloured. When younger the seedhead is quite tight and compact as well as being upright in branching. The foliage is narrow and soft green when the plant is putting on active growth.

**Occurrence:**

Occurs in all soil types, but favours areas of disturbance where it will temporarily colonise the area. Most common in full sun.

Comments:

A coloniser of disturbed areas. It is rarely propagated because its dispersal is so effective. Provides some feed in early winter for stock. Tolerant of saline areas too. C3 annual grass, occasional perennial grass.

Size: Up to 70cm

Flowering: Spring

Seeding: Early summer

Native species

Genus:

Microlaena

Common Name:

Weeping Grass

Species:

stipoides

Derivative of species name:

Like *Stipa* grass

Description:

A highly variable grass with a number of recognised forms across the Sydney area. Generally it grows in dense tufts that have a short spreading rhizome. The distinctive seedhead (on all forms) is long and nodding. It may be lightly branched at the lower end. Seeds are relatively large (over 1cm) and quite thick. They have a rough awn on the end which aids dispersal.

Occurrence:

Extremely common across the HSC locality in all vegetation types. It does however grow best in a lightly shaded and moisture rich position. May form large spreading drifts in the right situations.

**Comments:**

Tolerates highly acidic soils. Regarded highly as a pasture species since it grows all year round and has a relatively high protein content. Good drought tolerance too. Easily propagated by seed, there is no dormancy period and as such fresh seed can be sown immediately, alternatively it can be stored for up to 3 seasons before sowing. Very easily established by directly hand broadcasting seed onto the desired area. Can be used as a lawn substitute. Seeds are valuable feed for native birds, particularly parrots. C3 perennial grass.

Size: Up to 70cm (forms vary)

Flowering: All year

Seeding: All year

Native species

Genus:

Oplismenus

Common Name:

Basket Grasses

Species:

aemulus

imbecillis

Derivative of species name:

Allied, refers to its close appearance with other species.

Weak

Description:

Basket grasses are prostrate, mat forming perennial grasses. They spread vegetatively by stoloniferous stems which set down roots where they contact the ground. *O. aemulus* has shorter wider leaves compared to the longer, narrower leaves of *O. imbecillis*, otherwise they are very difficult to distinguish. The seedhead is short and has a bristly appearance with distinctive awns, it is generally around 10cm in length. *O. imbecillis* also prefers a more sheltered location.

Occurrence:

Widespread across the HSC locality on both clay and sandstone soils, but always favouring a moist lightly shaded position where it achieves best growth habit. Common in gullies, creeklines and shaded areas.



Comments:

A strong colonising plant (*O. imbecillis*). It is useful in early stages of bushland regeneration as a result to cover bare areas quickly. Can be most easily propagated by division of stem sections. Quickly provides useful habitat for fauna in reclaimed areas. C3 perennial grass.

Size: Under 30cm in height.
Upto 1m across.

Flowering: Warmer months

Seeding: Warmer months

Native species

Genus:

Panicum

Common Name:

Two-coloured Panic

Species:

simile

Derivative of species name:

Similar to other species

Description:

A short perennial grass which grows in a neat tuft. Developing seedheads have a lovely red hue. Branches on seedheads have a fine zig-zag arrangement. Leaves are very narrow and fine. They are hairless.

Occurrence:

Sporadic across both clay and sandstone soil areas of the HSC locality. Never in large amounts. Prefers an open sunny position. Easily overlooked. Maybe more common after fire when resprouting.



Comments:

Provides a source of seed for seed eating birds. Has potential for ornamental value if planted thickly, due to the pretty coloured seedheads. Likely C4 perennial grass.

Size: Up to 50cm

Flowering: Spring

Seeding: Summer

Native species

Genus:

Paspalidium

Common Name:

Spreading Panic grass

Species:

distans (syn. *radiatum*)

Derivative of species name:

Separated- referring to broken seed-head

Description:

A stiff tufted grass which is a perennial. Most growth occurs in warmer months, it is usually a low spreading tuft covered in fine hairs. Seed-heads are held on stems above foliage. The seedhead itself is unbranched and individual seeds are in broken sections along the stem. The seed sections also rotate around this stem along their arrangement.

Occurrence:

Uncommon and easily overlooked. Chiefly in forested areas growing as a coloniser, can be easily mistaken as weed grass, in particular with introduced Ehrharta, Panic Veldt Grass. A plant of moist open forests on either clay or right through to sandy soil with quite low nutrient value. Often in bushland interfaces particularly parks where its low habit allows it to survive a mowing regime.

**Comments:**

Propagation is generally uncommon, if so it would be by seed sown in the following warm season after collection. Seeds would probably be consumed by birds. Confusing species: Ehrharta, Panic Veldt Grass P.26. This species has bright green foliage and leaves have a weeping habit in comparison to *Paspalidium distans*. C4 perennial grass.

Size: Up to 0.7m usually under 0.3m depending on environmental conditions

Flowering: Warmer months

Seeding: Warmer months into Autumn

Native species

Genus:

Poa

Common Name:

A Tussock Grass

Species:

affinis

Derivative of species name:

Similar

Description:

A small densely tufted perennial grass. Takes on a soft, lush appearance in good growing conditions. Very similar in appearance to the exotic Winter Grass (*P. annua*) however, all parts of *P. affinis* are much larger. Straw coloured seedheads may persist on the plant for a few months after seed shed.

Occurrence:

Common in select locations. Prefers a clay soil in a shaded forest situation, but can also be found commonly in valleys or shaded hillsides growing on moist sandstone soils. Larger areas of *P. affinis* can be found in the lower section of Carr's Bush, Galston (Fagan Park).

**Comments:**

Not very drought tolerant. Provides seed for seed eating birds. Can respond well to fire by reshooting and taking advantage of the clear undergrowth conditions post fire. Older plants may spread to form larger clumps when longer stems droop and take root in the ground from leafy tufts at nodes along stems. Otherwise propagation is best by seed sown the following autumn after collection. C3 perennial grass.

Size: Up to 1m

Flowering: Spring

Seeding: Summer

Native species

Genus:

Themeda

Common Name:

Kangaroo Grass

Species:

australis (Syn. *T. triandra*)

Derivative of species name:

Southern

Description:

A large tussock grass. Long lived perennial. Actively grows in warmer months. Tufts can take on a reddish appearance particularly after frosty periods. Seedheads are held well above foliage and are highly distinctive in appearance. Ripe seedheads take on a yellow-brown to rich tan colour as they age with maturity. Fertile florets bear dark brown seeds with long sharp awns. These awns are twisted and measure 4-7cm in length.

Occurrence:

Widespread across the Hornsby area. Best examples are seen on clay soils in rural areas where it can be the dominant plant at ground level. Occasional on sandy soils when there is a clay influence bringing extra nutrients to the soil. Common in paddocks but can be easily grazed out and out-competed by introduced grasses/pasture. Commonly seen on irregularly mown roadside verges. Grows best in a full sun situation.



Comments:

Kangaroo Grass favours a frequent fire regime which stimulates fresh regrowth and subsequent seeding. Large areas of Kangaroo Grass would have existed across South-eastern Australia prior to the 1800's. It is quite drought resistant due to its deep roots. Propagation can be difficult as assessing ripe seed is challenging. Harvesting of whole seedheads and storing over winter followed by sowing in the next warm season is best. Seed is also difficult to extract from the florets. C4 perennial grass.

Size: Up to 1.2m

Flowering: Spring/Summer

Seeding: Summer/Autumn

Weed species

Genus: *Andropogon*

Species: *virginicus*

Description:

A tall tufted perennial grass upto 1m in height. Has a dry dead appearance particularly in summer. Leaves also attain a reddish orange tinge adding to this previous effect. Leaves extend sheath-like up the flowering/seeding stems. Seeds are covered in silky hairs which aid wind dispersal.

Occurrence:

Chiefly roadsides, fire trails and bush interfaces. Thrives on disturbance. Associated with low fertility soils. Can invade pasture. More invasive post fire when it can rapidly spread.

Comments:

Low fodder value. Introduced as a packing material around whiskey bottle imported into Australia, (reputedly). Resprouts after fire. C4 perennial grass.

Confusing similar species:

Themeda australis

See page: 22

Common Name: Whiskey Grass

Origin: America



Control:

De-seed by cutting off seedheads if immediate control is not possible. Crown individuals, chip out non-seeding plants. Spot spray if no seed present.

Weed species

Genus: *Avena*

Species: *fatua*

Description:

A robust tufted annual grass capable of growing well in harsh conditions. Favours full sun, is drought tolerant. Seedhead is very loose in appearance and pyramidal shaped. Seeds droop on the ends of branchlets, conspicuous long awn present too. Grows rapidly during winter.

Occurrence:

A major weed across the world in agriculture, particularly wheat and other cereal crops. Favours roadsides, fallow land, forgotten corners and open disturbed areas.

Comments:

Generally unpalatable to stock, more so with age. Long lived seedbank in soil (up to 10 years). Considered to be one of the world's worst agricultural weeds. A C3 annual grass.

Confusing similar species:

None

Common Name: Wild Oats/ Black Oats

Origin: Mediterranean



Control:

Hand pull before seed set. Cut and dispose of unripe seed before it is shed. Spot spray immature plants. Consistent follow up work is required for sustainable management.

Weed species

Genus: *Briza*

Species: *maxima*

Description:

Short slender upright annual grass. Hairless. Generally under 40cm. Distinctive nodding seedheads have spikelets that hang down. They are ovate to triangular in shape reminiscent of a bee or fly abdomen. Shivery Grass (*B. minor*) is also present in HSC areas, it's seedhead is much smaller in appearance to *B. maxima*. Both species grow rapidly through winter.

Occurrence:

Highly disturbed sites. Grassy areas. Prefers moist areas. Less impact in dry years as such.

Comments:

No feed value. Seedbank last up to 3 years. C3 annual grass.

Confusing similar species:

None

Common Name: Quaking Grass/ Blowfly Grass

Origin: Mediterranean



Control:

Hand pull before seed set. Spot spray before seed set. Cut and dispose of seed heads if present.

Weed species

Genus: *Bromus*

Species: *catharticus*

Description:

Annual or short lived perennial which can be quite densely tufted, grows from 0.3 - 1.2m. Seedheads tend to droop with age and weight. Spikelets are strongly laterally compressed.

Occurrence:

Isolated patches usually in corners of paddocks, roadside verges and orchards particularly in wetter margins although it is quite drought tolerant. Tolerates shade too. Most common through winter into early summer.

Comments:

Long lived seedbank in the soil; may take a while to exhaust. Useful pasture species with high forage value for stock. C3 annual grass.

Confusing similar species:

Austrodanthonia spp.

See page: 7

Common Name: Prairie Grass / Brome Grass

Origin: South America



Control:

Hand pull small infestations. Take care to remove all of the base of the plant as it is prone to breaking off thereby allowing regrowth. Cut and bag developing/ripe seedheads. Spot spray immature plants.

Weed species

Genus: *Chloris*

Species: *gayana*

Description:

A tall perennial grass which actively grows in warmer months. Spreads vegetatively by stolons but usually has a tufted appearance. Highly distinctive seedheads have upright branches from a central point, these dry out and remain on the plant for several months after seed shed.

Occurrence:

Used extensively as a pasture species. It is also extremely common along roadsides verges and will readily invade woodland areas on clay soils.

Comments:

Drought tolerant. Salt tolerant. Very common in Western Sydney. C4 perennial grass.

Confusing similar species:

Several native *Chloris* spp. (Windmill Grasses). Seedheads are held more horizontally in cross section as opposed to upright pointing seedheads of Rhodes Grass.

Common Name: Rhodes Grass

Origin: Tropical/Sub-tropical Africa



Control:

Hand pull before seed set. Deep rooted, so a mattock may be required on established clumps. Spot spray. May require follow up spraying when in active growth phases during summertime.

Weed species

Genus: *Digitaria*

Species: *sanguinalis*

Description:

A fast growing annual grass that starts as a spreading tuft rooting at nodes as it grows horizontally. Leaves and stems are somewhat hairy. Foliage may have a purplish tone. Seedheads are distinctive with fine spreading branches radiating out like fingers (4-10) appearing January– April.

Occurrence:

Lawns, disturbed ground, pastures, gardens, orchards or irrigated areas.

Comments:

Capable of massive seed production (150 000 seeds on a single plant). Low forage value, salt tolerant, aggressive but with low drought tolerance. C4 annual grass.

Confusing similar species:

Native *Digitaria* spp. are finer and form upright growing tufts.

See page: 11

Common Name: Summer Grass

Origin: Mediterranean



Control:

Hand weed in early growth stages. Possibly mow to catch seeds. Spot spray before seed set. Can display some herbicide resistance.

Weed species

Genus: *Echinochloa*

Species: *crus-galli*

Description:

An annual grass that grows in an erect stout manner. Tufts may be up to 1m in height. Stems are thick and robust carrying a pyramidal shaped inflorescence. Seedheads and young leaves are often reddish-purple in colour. Seedheads can also have a bristly appearance.

Occurrence:

Favours wetter areas where it grows rapidly from spring, often with several generations over a warm season. Common in roadside ditches, irrigated areas, creeklines or where water is readily available.

Comments:

An indicator of fertility as it doesn't grow on poor nutrient soils. A major weed of rice around the globe. C4 annual grass.

Confusing similar species:

Although native *Echinochloa* spp. are present in Sydney none occur in the HSC area.

Common Name: Barnyard Grass

Origin: Europe



Control:

Easily hand pulled at an early stage (red young leaves useful for identification). Cut at crown on more advanced specimens. Cut and dispose of seed heads. Spot spray if no seed present.

Weed species

Genus: *Ehrharta*

Species: *erecta*

Description:

A leafy tufted perennial grass with a delicate root system. Grows up to 60cm in height. Bright green colour. The erect seed head is often quite long in relation to plant size, often growing out through surrounding vegetation. It has smooth green seeds with no awns.

Occurrence:

Prefers a moist shaded situation. Very common in disturbed areas particularly bushland interfaces where it can form dense colonies. Able to grow very successfully in low light. Common in creek and drainage lines.

Comments:

Ability to reproduce and set seed at an early growth stage. Long lived soil seedbank. Very difficult to eradicate. C3 perennial grass, although grows very rapidly in warmer moist weather too.

Confusing similar species:

Similar to *Entolasia marginata* and *Microlaena stipoides*— distinguish with seed head comparison.

See page: 14 & 17

Common Name: Panic Veldt Grass/Ehrharta

Origin: South Africa



Control:

Spray. Extensive follow up hand weeding required. Brittle root system requires diligent hand weeding. Low concentrations of glyphosate based herbicides are effective.

Weed species

Genus: *Eragrostis*

Species: *curvula*

Description:

An aggressive tufted perennial grass with a deep root system. Grows upto 1m in height and can form extensive monocultures if given the opportunity. The small spikelets on the triangular shaped inflorescence are often dark in colour, containing many seeds. Foliage may also have a greyish appearance.

Occurrence:

A very common species of disturbed areas, roadside verges, pasture, bushland edges and fire trails. Favours areas of low fertility soils.

Comments:

A number of forms exist; many highly desirable pasture species but not recommended. The weedy form (indistinguishable) is relatively unpalatable. One of the worst weed grasses in the HSC locality. Highly drought tolerant. Huge annual seed set volume. C4 perennial grass.

Confusing similar species:

Silver leaved forms of ornamental native grasses such as *Poa 'Eskdale'*. Also native *Poa affinis* and *Poa labillardieri*.

See page: 21

Common Name: African Love Grass

Origin: South Africa



Control:

Total removal by crowning, de-seeding and bagging seedheads, spray when actively growing. Encourage native grasses (or other pasture) to outcompete it in cooler months.

Weed species

Genus: *Holcus*

Species: *lanatus*

Description:

A softly hairy tufted perennial grass growing to 60cm in height. Distinctive inflorescence is pinkish in colour while the hairy leaves give the foliage a greyish green appearance.

Occurrence:

Prefers damp areas and disturbed sites such as poor pastures and roadside verges or drainage lines.

Comments:

Huge seed set on individual plants of up to 240,000 seeds. Poor pasture species because of velvety foliage. Not drought tolerant. C3 perennial grass.

Confusing similar species:

Red Natal Grass (weed) also has red tinted seedheads.

See page: 29

Common Name: Yorkshire Fog

Origin: Europe



Control:

Hand pull small young infestations. Spot spray before seed set.

Weed species

Genus: *Hyparrhenia*

Species: *hirta*

Description:

A tall tufted long lived perennial grass to over 1m in height. Highly aggressive, spreading quickly in large monocultures. Seedheads share distinctive paired branches, the fertile seed has a long awn. Leafy bracts on the seedhead are red.

Occurrence:

A rapidly increasing weed grass in the HSC locality and across Northern Sydney. Invades road edges most commonly where it is spread by mowing equipment. Also able to invade undisturbed native vegetation.

Comments:

Highly drought resistant, little pasture value when allowed to grow tall. Susceptible to frost. Prefers full sun. Self fertilising- allowing new populations to start from a single plant. C4 perennial grass.

Confusing similar species:

Themeda australis, Whiskey Grass, Barbwire Grass. Closer inspection of seedhead will reveal differences.

See page: 9,22 & 23

Common Name: Coolatai Grass

Origin: Africa/ Mediterranean



Control:

Hand pull fresh outbreaks. De-seed bigger infestations. Spray. Clean mowing machinery after working with Coolatai Grass to prevent seed spread. Any treatment will require diligent follow-up maintenance.

Weed species

Genus: *Lolium*

Species: *perenne*

Description:

Dark green, shiny foliage is characteristic. It is a short lived perennial occasionally tufted annual grass to 80cm tall. Carries a narrow seedhead up to 20cm in length. Tillers have a reddish purple base.

Occurrence:

Although common as a pasture species, it also invades bushland edges and is common along roadsides. Prefers a fertile clay soil, uncommon on sandy infertile soils. Not very drought tolerant. Can be used as a lawn grass.

Comments:

Readily hybridises with other types of Rye Grass. Commonly creates allergies from pollen in humans. Regarded as one the best pasture species for temperate regions across the world. Actively grows in cooler months providing valuable volumes of feed. C3 annual/perennial grass.

Confusing similar species:

None.

Common Name: Perennial Rye Grass

Origin: Mediterranean



Control:

Hand pull small areas. Spot spray.

Weed species

Genus: *Melinis*

Species: *repens*

Description:

A tufted annual grass or occasionally short lived perennial grass to 1m in height. Can also spread by stolons. Easily recognised by colourful red seedhead due to numerous red hairs on seed head.

Occurrence:

Mainly a sub-tropical weed extending to south to Sydney. Common along roadside edges or waste areas. Seems to prefer sandy soils in full sun. Common in old banana and pineapple plantations on NSW north coast.

Comments:

A minor weed. Grows quickly after fire disturbance, seeding within 19 weeks. C4 grass.

Confusing similar species:

Yorkshire Fog also has red seedheads. Similar leaf arrangement to *Entolasia marginata*.

See page: 14 & 27

Common Name: Red Natal Grass

Origin: South Africa



Control:

Hand pull, spot spray.

Weed species

Genus: *Paspalum*

Species: *dilatatum* & *urvillei*

Description:

Long lived tough and robust perennial tufted grasses. *P. dilatatum* reaches 1.5m, *P. urvillei* upto 2.5m. Actively grow in summer. An open seedhead, slightly nodding with a double row of seeds along each branch (spikelet). Husks over seeds may be dark purple in colour.

Occurrence:

Widespread pasture species (*P. dilatatum*). Preferring full sun and abundant moisture but is also quite tolerant of dry spells. *P. urvillei* more likely to be along drainage lines. Both species favour clay soils and abundant moisture. Favour disturbance acting as a coloniser.

Comments:

Sticky seeds aid dispersal. *P. dilatatum* is a highly valued pasture species, more so than *P. urvillei*. C4 perennial grasses- both species.

Confusing similar species:

Native Paspalums have distinctive twin branched seedhead and are much smaller in size.

Common Name: Paspalum

Giant Paspalum

Origin: South America



P. dilatatum

P. urvillei

Control:

Crown small plants, dig out larger specimens. Tenacious root system with a short rhizome can be difficult to completely remove. Spot spray. De-seed when in seed. If removing consider what will plant will replace the weed- will it be another weed?

Weed species

Genus: *Pennisetum*

Species: *setaceum*

***Class 5 Noxious Weed in HSC**

Description:

A tufted long lived perennial grass to 90cm+ tall, with highly decorative long feathery seedheads that are light pinkie-purple in colour.

Occurrence:

A garden escapee, now listed as noxious. Currently only isolated occurrences on bushland interfaces.

Comments:

Incorrectly marketed by retail nurseries as a native species. Fluffy seedhead produces wind dispersed seeds. Has a long lived seedbank. C4 perennial grass.

Confusing similar species:

P.alopecuroides (Swamp Foxtail), a native/ cosmopolitan species has shorter brown seedheads.

Common Name: *Fountain Grass*

Origin: Africa



Control:

Crown out individuals, spot spray. Bag seedheads and dispose in green waste bin. Continued monitoring after control is necessary for dealing with new outbreaks.

Weed species

Genus: *Phalaris*

Species: *aquatica*

Description:

A tall tussock perennial grass to 1.5m in height. Very robust in growth and appearance. Foliage can appear to be pale grey-green in colour. Tussocks often hold large volumes of rank growth. Seedheads are tight and compact held high above foliage on stout stems.

Occurrence:

Occasional on roadside verges more so where drainage is impeded or creeklines are near roads, for example, the corner of Bay Rd and Carrs Rd Galston. Also common in orchards and irrigated areas.

Comments:

Introduced to Australia as an important pasture species. C3 perennial grass.

Confusing similar species:

None

Common Name: Phalaris

Origin: Mediterranean



Control:

Due to large size, cut down tussock and allow to resprout before applying herbicide onto fresh regrowth. Bag seedheads and dispose of.

Weed species

Genus: *Setaria*

Species: *gracilis* & *pumila*

Description:

Pigeon Grasses can grow as annuals or short lived perennial grasses. They generally grow as slender tufts in highly disturbed situations. Compact neatly arranged seedheads are distinctive with short bristles often purple in colour. Tillers are common and are red at the base. Plants rarely exceed 50cm.

Occurrence:

Highly disturbed areas. Track edges, fire trails, road sides, bushland interfaces and pasture.

Comments:

Provide food for seed eating birds. C4 short lived perennial grasses.

Confusing similar species:

Neat, distinctive, compact seedhead rarely causes confusion with other species.

Common Name: Pigeon Grass

Origin: America



Control:

Hand weed taking care to remove all tillers as it easily snaps at ground level. De-seed and dispose off. Spray bad infestations before seed set/drop.

Weed species

Genus: *Sporobolus*

Species: *africanus* & *fertilis*

Description:

Tenacious tough perennial grasses. Long lived. Distinctive long slender seedheads often dark in colour. Tiny seeds are numerous along each seedhead. Foliage is particularly tough and wiry. *S. africanus* to 60cm. *S. fertilis* grows to 1.5m.

Occurrence:

Very widespread. Tracks, fire trails, bushland interfaces, anywhere where there is disturbance basically. Commonly colonises bare compacted soils.

Comments:

As of its toughness it is extremely drought tolerant. Strong root system, can handle heavy traffic. Indicates poor fertility soils. Seeds are sticky when wet which greatly aids distribution. *S. fertilis* is a serious pasture weed, it is not grazed as the foliage is too tough. C4 perennial grass.

Control:

Crown, spot spray when actively growing. Collect seedheads and dispose in green waste bin. Replace dug out weed grasses with native grass or other suitable species to avoid reinfestation.

Common Name: Parramatta Grass & Giant Parramatta Grass

Origin: South Africa



P. fertilis

Confusing similar species:

Some native *Sporobolus* not in Hornsby Shire however, they are generally in woodland in Western Sydney. They have a seedhead with seeds arranged in a discontinuous pattern up the stem.

Glossary

Annual- A plant that complete its lifecycle in one season, surviving until next growing season as stored seed in the soil.

Awn- A bristle-like appendage on the end of the seed to assist in dispersal by adhering to vectors. The awn can also assist in winding the dispersed seed into the surface of the ground.

Bract- A leaf like appendage usually near the flowering parts. Often coloured.

Branch- A smaller side section of the entire inflorescence holding seeds.

Cosmopolitan - Distributed in many countries.

Florets– The single flowers within an inflorescence containing the reproductive parts.

Inflorescence- The entire seedhead including its shape and arrangement.

Inrolled- Having both the margins of the leaf blade folded back either up or down.

Node- A swollen point along the stem from where a leaf or bract arises.

Panicle- The standard botanical shape of a grass inflorescence, with branches or secondary branches bearing spikelets.

Perennial- A plant that completes its lifecycle over more than one growing season, flowering and seeding several times. Above ground parts may die back annually and only the root zone and dormant buds stay alive until the next growing season returns.

Prostrate- A plant that grows horizontally or flat along the ground

Rhizome- A stem that grows below the ground and sends up new stems above the ground from nodes.

Spike– A simple unbranched inflorescence with spikelets (containing seeds) attached directly with no secondary branching.

Spikelet—A term for the simple unit of a grass seedhead. Holds one or more florets.

Stolon- An above ground stem that grows along the ground, sprouting roots at nodes and sending up new growth points at these nodes too.

Tiller- A new shoot that grows from the base of the grass tuft and carries a new flowering stem.

What are C3 and C4 Native Grass?

The perennial grasses can be classified as either C3 or C4 plants. These terms refer to the different pathways that plants use to capture carbon dioxide during photosynthesis. All species have the more primitive C3 pathway, but the additional C4 pathway evolved in species in the wet and dry tropics. The first product of carbon fixation in C3 plants involves a 3-carbon molecule, whilst C4 plants initially produce a 4-carbon molecule that then enters the C3 cycle. Why are these differences important?

These differences are important because the two pathways are also associated with different growth requirements. C3 plants are adapted to cool season establishment and growth in either wet or dry environments. On the other hand, C4 plants are more adapted to warm or hot seasonal conditions under moist or dry environments. A feature of C3 grasses is their greater tolerance of frost compared to C4 grasses. C3 species also tend to generate less bulk than C4 species; however, feed quality is often higher than C4 grasses. Differences between C3 and C4 species are shown in Table 1.

Table 1: Features of C3 and C4 grasses

	C3	C4
Initial molecule formed during photosynthesis	3 carbon	4 carbon
Growth period	cool season or yearlong	warm season
Light requirements	lower	higher
Temperature requirements	lower	higher
Moisture requirements	higher	lower
Frost sensitivity	lower	higher
Feed quality	higher	lower
Production	lower	higher
Examples	weeping grass and common wheatgrass	kangaroo grass, red grass and wire grass

The presence of both C3 and C4 species can be desirable in a pasture as they can occupy different niches (e.g. C3 species are often more abundant in the shade of trees and on southerly aspects, while C4 species often dominate full-sun conditions and northerly aspects) and thereby provide greater groundcover across a range of conditions. It is not uncommon to find both C3 and C4 species in one paddock. This has advantages in providing a broader spread of production throughout the year for both grazing enterprises and native animals.

Adapted from- <http://www.dpi.nsw.gov.au/agriculture/pastures/pastures-and-rangelands/native-pastures/what-are-c3-and-c4-native-grass>

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Further information on the bushland and biodiversity of Hornsby Shire can be found at- hornsby.nsw.gov.au/bushland

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