Characteristics of perennial grasses [poster]

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### Characteristics of Perennial Grasses

Compiled by Trevor Lacey and Geoff Moore, Department of Agriculture

**Growth characteristics of perennial C3 grasses:** This table presents information on range of a perennial grass species but is not a recommendation for them. Consider species characteristics in relation to local conditions and then source specific variety information before making decisions. Trial grasses before planting large areas (see key below for star rating system).

<table>
<thead>
<tr>
<th>Species</th>
<th>Cool season growth</th>
<th>Summer state (refers to response to summer rain &gt;15 mm)</th>
<th>Frost tolerance</th>
<th>Inundation tolerance</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
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<td><strong>Cool season growth</strong></td>
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<td><strong>Inundation tolerance</strong></td>
<td><strong>Comments</strong></td>
</tr>
<tr>
<td>Cocksfoot (Dactylis glomerata) - (Mediterranean)</td>
<td>Tufted Seed</td>
<td>6 500 2 to 4 or 1 to 2 mixtures</td>
<td>None reported</td>
<td>**</td>
<td>4.0</td>
</tr>
<tr>
<td>Perennial ryegrass ( Lolium perenne)</td>
<td>Various Tufted Seed</td>
<td>8 650 5</td>
<td>Ryegrass staggers, potential nitrate poisoning</td>
<td>**</td>
<td>4.5</td>
</tr>
<tr>
<td>Phalaris (Phalaris aquatica)</td>
<td>Various Dense tufts Short mizone</td>
<td>6 550 5</td>
<td>Phalaris staggers and phalaris sudden death (alkaloids) cyanide?</td>
<td>**</td>
<td>4.7</td>
</tr>
<tr>
<td>Puccinellia (Puccinellia ciliaris)</td>
<td>Menemen Tufted Seed</td>
<td>375 2</td>
<td>None reported</td>
<td>**</td>
<td>5.07 persists at lower pH</td>
</tr>
<tr>
<td>Tall fescue ( Festuca arundinacea) - Summer-active</td>
<td>Various Tufted Seed</td>
<td>7 600 5 to 8</td>
<td>Erog occasionally</td>
<td>**</td>
<td>4.3</td>
</tr>
<tr>
<td>Tall fescue ( Festuca arundinacea) - Winter-active, summer-dormant</td>
<td>Various Tufted Seed</td>
<td>6.5 500 5 to 8</td>
<td>Erog occasionally</td>
<td>**</td>
<td>4.3</td>
</tr>
<tr>
<td>Tall wheatgrass ( Thinopyrum ponticum)</td>
<td>Tyrell, Dundas Tufted Seed</td>
<td>375 3 to 12 or 3 to 5 mixtures</td>
<td>None reported</td>
<td>**</td>
<td>4.5</td>
</tr>
<tr>
<td>Veldt grass ( Chloris caudata)</td>
<td>Mission Tufted Seed</td>
<td>325</td>
<td>None reported</td>
<td>**</td>
<td>4.0</td>
</tr>
</tbody>
</table>

**Key**

- Cool season growth
  - * Dormant as requires temperatures >20°C/15°C (day/night temp.) for growth
  - ** Slow growth in cool season, as growth limited by temperatures <18°C/13°C
  - *** Moderate cool season growth, as growth limited by temperatures <15°C/10°C
  - **** Good to very good cool season growth, only restricted by day temperatures <12°C

- Summer state (refers to response to summer rain >15 mm)
  - * Summer-dormant (negligible summer growth)
  - ** Slow (delayed) response to summer rain with low biomass production
  - *** Responsive to summer rain
  - **** Highly responsive to summer rain – grows rapidly in response to summer rain

- Frost tolerance
  - * Sensitive, extensively damaged by frosts, with some plant deaths
  - ** Low frost tolerance, typically green-leaf is killed by frosts and occasional plant deaths
  - *** Moderate frost tolerance, leaf damage when frosts < –3°C
  - **** High frost tolerance, usually minimal damage

- Inundation tolerance
  - * Nil tolerance, killed by inundation of > 1 day
  - ** Low, tolerates short periods of inundation for < 1 week
  - *** Moderate, tolerates inundation for 2-4 weeks
  - **** High, tolerates extended periods of inundation of 1-3 months

**Drought tolerance**
- * Low drought tolerance (growing season length typically >8 months)
- ** Moderate drought tolerance (growing season length typicaly <8.5 months)
- *** High drought tolerance (annual rainfall <450 mm and/or growing season length <9.5 months)
- **** Very high drought tolerance (annual rainfall <325 mm)
- ***** Extremely drought tolerant (annual rainfall <250 mm)

**Waterlogging tolerance** - classad adapted from McDonald et al. (1990)
- * Nil, no tolerance of waterlogging, only grows on well drained or rapidly drained sites
- ** Low waterlogging tolerance, can grow on moderately well drained sites (perched water table within 30 cm for 3-6 weeks and/or growing season length >9.5 months)
- *** Moderate waterlogging tolerance, will grow on imperfectly drained sites (perched water table within 30 cm of the surface for 3-6 weeks in an average season, in longer in a wet season)
- **** High waterlogging tolerance, will grow on poorly drained sites (perched water table within 30 cm of the surface for > 10 weeks in an average season)
- ***** Very high waterlogging tolerant, grows on poorly drained sites, where the soil is inundated or the profile is saturated for > 3 months in most years

**Salt tolerance**
- * Nil, only grows on non-saline soils (ECe <200 mS/m)
- ** Slight salt tolerance, grows on soils with an ECe 200-400 mS/m
- *** Moderate salt tolerance, grows on soils with an ECe 400-800 mS/m
- **** High salt tolerance, grows on soils with an ECe > 800-1600 mS/m

**Confidence level for Western Australian conditions**
- * Low – limited testing or grower experience
- ** Moderate – some testing or grower experience
- *** High – extensively grown or tested
- **** Native species

**References**

New South Wales Agriculture, Agnote series; Department of Primary Industries, Queensland DPI note series; Tim Wiley, Department of Agriculture; K. Gethardh, P. Sanford, L. Cransberg. (1998) Perennial grasses for animal production in the high rainfall areas of Western Australia, Miscellaneous publication No. 2/98.

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Growth characteristics of perennial C4 grasses:

This table presents information on range of a perennial grass species but is not a recommendation for them. Consider species characteristics in relation to local conditions and then source specific variety information before making decisions. Trial grasses before planting large areas (see key below for star rating system).

#### Growth characteristics

<table>
<thead>
<tr>
<th>Species</th>
<th>Growth habit</th>
<th>Spreading habit</th>
<th>Seed size/rhizome</th>
<th>Soil type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bambusa panic (Panicum coloratum)</td>
<td>Tufted</td>
<td>No runners, seed</td>
<td>400 (325 south coast)</td>
<td>Low to moderate clay and sands to loams</td>
<td>Best for drought tolerance and heavy clay soil</td>
</tr>
<tr>
<td>Bambusa (Panicum purpureum)</td>
<td>Large tufted</td>
<td>No runners, no seed</td>
<td>650</td>
<td>Low to high</td>
<td>Tall grass with good quality and drought tolerance</td>
</tr>
<tr>
<td>Buffel grass (Cenchrus ciliaris)</td>
<td>Erect tufted</td>
<td>Seed</td>
<td>300 2 to 3 or 0.5 to 6</td>
<td>Low to high</td>
<td>Low cold tolerance – suggest for north-eastern agricultural region, low rainfall station country only</td>
</tr>
<tr>
<td>Consol lovegrass (Eragrostis curvata)</td>
<td>Tufted</td>
<td>Seed</td>
<td>400 0.3 to 1 or 0.3 to 0.5 mixtures</td>
<td>Low to moderate</td>
<td>May lose feed quality quickly if grazing not controlled</td>
</tr>
<tr>
<td>Couch (Cynodon dactylon)</td>
<td>Below ground</td>
<td>Tufted</td>
<td>500</td>
<td>Medium</td>
<td>Weed of crops, hard to remove</td>
</tr>
<tr>
<td>Curly windmill grass (Chloris gayana)</td>
<td>Small tufted</td>
<td>Seed and rooting from stem nodes</td>
<td>None reported</td>
<td>Light to medium to heavy</td>
<td>Limited testing, possible option for eastern wheatbelt</td>
</tr>
<tr>
<td>Digit grass (Digitaria eriophora)</td>
<td>Tufted</td>
<td>Seed</td>
<td>450 1 to 2</td>
<td>High quality feed under fertile</td>
<td>Native species - long lived</td>
</tr>
<tr>
<td>Kangaroo grass (Themeda triandra)</td>
<td>Tufted</td>
<td>None reported</td>
<td></td>
<td>No to high</td>
<td>Native species, seed supply limited</td>
</tr>
<tr>
<td>Kikuyu (Pennisetum clandestinum)</td>
<td>Runners and rhizomes</td>
<td>Runners, seed</td>
<td>500 (400 south coast)</td>
<td>Low to very high</td>
<td>Only on winter waterlogged or summer moist soils in north, all soils on south coast</td>
</tr>
<tr>
<td>Panic (Panicum maximum)</td>
<td>Tufted</td>
<td>Short rhizomes</td>
<td>600 2 to 5 or 1 to 3 in mixtures</td>
<td>High</td>
<td>Wet sites with very good autumn growth</td>
</tr>
<tr>
<td>Paspalum (Paspalum dilatatum)</td>
<td>Open tufted</td>
<td></td>
<td>600 3 to 5</td>
<td>Heavy</td>
<td>Failure in WA, possibly OK in South Australia</td>
</tr>
<tr>
<td>Purple pigeon grass (Setaria incarescens)</td>
<td>Tufted</td>
<td>Seed</td>
<td></td>
<td>Moderate</td>
<td>Has performed OK on some poor sands</td>
</tr>
<tr>
<td>Rhodes grass (Chloris gayana)</td>
<td>Tufted and runners</td>
<td>Runners, seed</td>
<td>425 1 to 2</td>
<td>Medium</td>
<td>Seepage and summer wet areas</td>
</tr>
<tr>
<td>Saltwater couch (Paspalum vaginatum)</td>
<td>Rhizomes and stolons</td>
<td>Runners</td>
<td>Summer moist</td>
<td>High</td>
<td>Failure in WA, possibly OK in South Australia</td>
</tr>
<tr>
<td>Signal grass (Urochloa decumbens)</td>
<td>Tufted</td>
<td>Seed</td>
<td>500 (450 south coast)</td>
<td>Low to high</td>
<td>Native species – short-lived perennial (2-3yr) - prolific seeder in wet summers</td>
</tr>
</tbody>
</table>

**Notes:**

- **Soil types:**
  - Light to medium clays
  - Medium clays
  - Medium to heavy clays
  - Heavy clays
  - Clay

- **Growth habit:**
  - Tufted
  - Runner

- **Spreading habit:**
  - Spreading

- **Seed size/rhizome:**
  - Seed
  - Seed, mixtures
  - Seed, short rhizomes
  - Seed, short stolons
  - None reported

- **Soil type:**
  - Sandy
  - Sandy to loams
  - Sandy loams
  - Sandy to heavy clays
  - Heavy clays
  - Clay

- **Comments:**
  - Best for drought tolerance and heavy clay soil
  - Tall grass with good quality and drought tolerance
  - Low cold tolerance – suggest for north-eastern agricultural region, low rainfall station country only
  - May lose feed quality quickly if grazing not controlled
  - Weed of crops, hard to remove
  - Limited testing, possible option for eastern wheatbelt

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