Cool Season Turfgrass Selection

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Turfgrass Selection Depends on Many Factors

Desirable Attributes

• Wear tolerance
• Rapid recovery
• Traction
• Density
• Compaction resistance
• Environmental stress tolerance
• Pest/Disease resistance
• Appearance

Origin of Cool-Season Turfgrasses

• Grazing pressure from cattle
  – Wear tolerance
  – Defoliation tolerance

Limiting Factors for Cool-Season Turfgrass Growth

• HEAT!
  – Intensity and duration
  – Denatures proteins/enzymes
  – Photorespiration wastes energy
• Optimal temperature: 60-75 F

How a Turfgrass Plant Grows
Kentucky Bluegrass (\textit{Poa pratensis})

- Rhizomatous growth habit
- Moist, well-drained soils
- Germination: 7-21 days
- Establishment rate: Fair
- Root system: perennial
- Most commonly used cool-season turf

Kentucky Bluegrass Management

- Mowing height: 0.75 - 2.5”+
- Irrigation: Prevent dormancy
  - Water use rate: moderate
- Fertility: 4 lb/M+ annually
- Diseases
  - Necrotic ring spot
  - (Summer patch)
  - Leaf spot
  - Powdery mildew (shade)

Kentucky Bluegrass Traits

- Wear tolerance: Fair
- Recuperative ability: Fair
- Cold tolerance: Good to excellent
- Leaf texture: Fine to medium
- Color: Medium to dark
- Shade tolerance: Poor
- Management requirements: Low to high*  
  *Cultivar-dependent

Perennial ryegrass (\textit{Lolium perenne})

- Bunch type growth habit
- Moist, acid to neutral soils
- Germination: 5-7 days
- Establishment rate: Good
- Root system: annual
- Commonly used for overseeding

Perennial ryegrass Management

- Mowing height: 0.5 - 2”  
  - Tough vascular bundles require sharp blades
- Irrigation: Survive long drought periods
- Fertility: 4 lb/M+ annually
- Diseases
  - Crown rust  
  - Brown patch
  - Pythium  
  - Typhula blight
  - Red thread
- Endophytes: insect resistance

Perennial ryegrass Traits

- Wear tolerance: Fair to good
- Recuperative ability: Poor
- Cold/Heat tolerance: Poor to fair
- Leaf texture: Medium
- Color: Light to dark
- Shade tolerance: Fair
- Management requirements: Medium
Annual Ryegrass (*Lolium multiflorum*)

- **ANNUAL!**
- Bunch type growth habit
- Light green color
- Coarse leaf texture
- Inexpensive
- *Short-term soil stability*

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Tall Fescue (*Festuca arundinacea*)

- Bunch type growth habit
- Wide soil range (sandy OK)
- Germination: 4-12 days
- Coarse leaf texture
  - Mixes poorly with other species
  - “Turf-types” include “dwarf” cultivars
- Deep-rooted but high water use rate
- Endophytes: insect resistance

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**Tall Fescue Management**

- Mowing height: > 1.5”
  - Tough vascular bundles require sharp blades
- Irrigation: Necessary for top quality
  - Survives gradual dormancy
- Fertility: Early spring, fall
- Diseases
  - Brown patch, Snow molds
- Overseeding required for uniformity

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**Tall Fescue Traits**

- Wear tolerance: Excellent
- Recuperative ability: Poor
- Cold tolerance: Poor!
- Heat tolerance: Excellent!
- Color: Light to medium
- Shade tolerance: Good
- Management requirements: Low

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**Fine Fescues**

- Creeping red fescue (*F. rubra*)
  - Rhizomes
- Chewings fescue (*F. rubra var. commutata*)
  - Bunch type growth
- Hard fescue (*F. longifolia*)
  - Bunch type growth
- Sheeps fescue (*F. ovina*)
  - Bunch type growth

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**Fine Fescues**

- Fine (narrow) leaf texture
  - Mixes OK with bluegrass
- Low maintenance turf
  - Slow-growing
  - Avoid traffic
- Endophytes: insect resistance
Fine Fescue Management

- Mowing height: > 1.5"
- Irrigation: Necessary for top quality
  - Survives gradual dormancy
- Fertility: Early spring, fall
- Diseases
  - Leaf spot, red thread
- Little/no traffic

Species Not Useful for Lawns in Cool-Season Zone

- Rough bluegrass (Poa trivialis)
  - OK in moist shade
  - Poor traffic and summer stress tolerance
- Creeping bentgrass (Agrostis palustris)
  - Very high maintenance, poor traffic tolerance
- Bermudagrass, Zoysiagrass
  - Warm-season grasses

Seeding Rates

<table>
<thead>
<tr>
<th>Grass species</th>
<th>Rate (lb/1000 ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kentucky bluegrass</td>
<td>1 – 2</td>
</tr>
<tr>
<td>Supina bluegrass</td>
<td>1.25</td>
</tr>
<tr>
<td>Perennial ryegrass</td>
<td>7 – 9</td>
</tr>
<tr>
<td>Tall fescue</td>
<td>7 – 9</td>
</tr>
<tr>
<td>Fine fescues</td>
<td>3 – 5</td>
</tr>
<tr>
<td>Creeping bentgrass</td>
<td>0.25 – 1.0</td>
</tr>
</tbody>
</table>

† Rate may be cultivar-dependent or establishment-rate dependent.  ‡ Usually mixed at 3-10% with other species.

Why Use Mixtures and Blends?

Mixture: 2 or more species
- Achieve multiple attributes
  - Wear tolerance
  - Stability
  - Disease resistance

Blend: 2 or more cultivars of same species
- Avoid incompatible mixes/blends
  - Leaf textures, color
  - e.g., Tall fescue in Kentucky bluegrass

Kentucky Bluegrass Categories

- Common: Upright growth, leaf spot disease; low maintenance
- BVMG: Medium growth, density, texture, disease rs (except stripe smut)
- Aggressive: Dense, prostrate growth
- Compact: Low growth habit, tolerate close mowing, long winter dormancy
- Mid-Atlantic: Long, deep rhizomes; med. maint.
- Julia: Leaf spot resistance, susceptible to dollar spot
- Bellevue: Fall, early spring color; medium ht., texture, density, disease and billbug resistance

Types of Kentucky Bluegrass

<table>
<thead>
<tr>
<th>Common</th>
<th>Improved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upright growth</td>
<td>Prostrate growth</td>
</tr>
<tr>
<td>Early spring</td>
<td>Denser turf</td>
</tr>
<tr>
<td>greenup</td>
<td>Slower growth rate</td>
</tr>
<tr>
<td>Environmental</td>
<td>Higher quality</td>
</tr>
<tr>
<td>stress tolerance</td>
<td>High maintenance</td>
</tr>
<tr>
<td>Low maintenance</td>
<td>Better disease</td>
</tr>
<tr>
<td>Susceptible to</td>
<td>resistance</td>
</tr>
<tr>
<td>leaf spots</td>
<td></td>
</tr>
</tbody>
</table>

Cultivars of Kentucky Bluegrass

Common
• Alene
• Kenblue
• Park
• Ronde
• South Dakota

Improved
• Touchdown
• Limousine
• SR 2100
• Rugby II
• Nuglade
• Fairfax
• Award

Kentucky Bluegrass and Perennial Ryegrass Seed Mixtures

• Why do recommendations for KBG/P. rye mixtures differ?
• Client dissatisfaction: a 50:50 mixture ≠ 50:50 stand
• Objective:
  – Determine if turf characteristics depend on type of KBG used in mixtures with perennial ryegrass

Species and Cultivars Used in Athletic Seed Mixture Study†

<table>
<thead>
<tr>
<th>Species Cultivars Used in Athletic Seed Mixture Study†</th>
<th>Percent KBG:P.R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision SR4200, Manhattan</td>
<td>95:5</td>
</tr>
<tr>
<td>Kent. bluegrass</td>
<td>85:15</td>
</tr>
<tr>
<td>-Aggressive Limousine, Touchdown, Fairfax</td>
<td>75:25</td>
</tr>
<tr>
<td>-BVMG Cannon, Merit, Viva</td>
<td>65:35</td>
</tr>
<tr>
<td>-Compact Midnight, Indigo, Alpine</td>
<td>50:50</td>
</tr>
<tr>
<td>-Common Alene, Kenblue, Ronde</td>
<td>25:75</td>
</tr>
</tbody>
</table>


Turf Composition Depends on Type of Kentucky bluegrass in Mixture, Nov. 1999 †

<table>
<thead>
<tr>
<th>Percent KBG in turf stand</th>
<th>45.3</th>
<th>43.0</th>
<th>45.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSD (0.05) w/in mix</td>
<td>9.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSD (0.05) between types and mixtures</td>
<td>8.5</td>
<td></td>
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</tr>
</tbody>
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† 14 month turf subjected to 30 simulated football games (Verona, WI).

Conclusion

• Use the best mixture and blends for the site!