Todays Discussion – Part 1 – Roch

*Common Lawn Grass Species*

- What’s unique about lawn species we recommend in Nebraska?
- Species water needs and root depth.
- Deciding when the lawn needs watering.
- How much water should I apply?
- What are the advantages of a cool-season grass blend or mixture?

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**Cool vs. Warm Season**

**Cool Season**
- Kentucky bluegrass
- Tall fescue
- Perennial ryegrass
- Fine fescues
- Bentgrasses
- Annual bluegrass

**Warm Season**
- Buffalo grass
- Zoysiagrass
- Bermuda grass
- St. Augustine grass
- Centipede grass
- Bahiagrass
Kentucky Bluegrass

- Rhizomes
- Fine Leafed
- Dormancy
- Fair Shade Tolerance, Good Recuperative Potential
- Many Cultivars
- Shallow Rooted
- Thatchy
- Drought Resistant

Kentucky Bluegrass Uses

- Home lawns
- Grounds
- Parks
- Sports turfs

Tall Fescue

- Bunchgrass
- Good Wear & Shade Tolerance
- Coarse Texture
- Many New Cultivars
- Deep Rooted
- Drought Resistant

Tall Fescue Uses

- Lawns
- Grounds
- Parks
- Sports Turfs
- Roadside
- Airfields
- Playgrounds
- Waterways
Buffalograss

*Buchloe dactyloides* (Nutt.) Engelm

- Stolons
- Poor Wear & Shade Tolerance
- Blue-green color
- Improved Cultivars
- Deep Rooted
- Drought & Heat Tolerant

Buffalograss Uses

- Home lawns
- Grounds
- Parks
- Utility turfs
- Roadsides
- Golf courses
  - Fairways
  - Tee
  - Bunker surrounds

Buffalograss Management

- 1/2" - Unmowed
  - Vegetative cultivars perform better than seeded at lower mowing heights
- 0-3 lbs. per 1000 ft²
- Irrigate to prevent stress

Female

Male

Buffalograss

3" unmowed
Drought Response (how it looks under drought; may be cosmetic)

- Buffalograss
- Zoysiagrass
- Fine Fescue(s)
- Tall Fescue
- Ky. Bluegrass

Drought Resistance

- Tolerance
- Avoidance
- Escape

J. Levitt, 1980

Drought Escape

- Plant completes its life cycle prior to the onset of drought

Examples: Downy Brome, Annual Bluegrass

Drought Tolerance

- Increased tolerance of dehydration
- Osmotic adjustment
  - Na⁺, K⁺, Cl⁻
- Recycling of CO₂
- Ability to recover

Example: Kentucky bluegrass

Drought Avoidance Mechanisms

- Deep, Extensive Root System
- Root Plasticity
- High Root:Shoot

Example: Tall Fescue

Turfgrass water use (may or may not be related to drought resistance)

Total amount of water used for growth plus that lost by transpiration and evaporation from plant and soil surfaces.

J. B. Beard, 1973

Measured when water is not limited
Turfgrass ET Classification

Relative ET Ranking

- Very low: < 4.0
- Low: 4.0 - 4.9
- Medium low: 5.0 - 5.9
- Medium: 6.0 - 6.9
- Medium high: 7.0 - 7.9
- High: 8.0 - 8.9
- Very high: > 9.0

Reported range of turfgrass ET by species:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>ET+ (mm day⁻¹)</th>
<th>Inches/season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tall Fescue</td>
<td>Festuca arundinacea</td>
<td>7 - 13</td>
<td>100</td>
</tr>
<tr>
<td>Perennial Ryegrass</td>
<td>Lolium perenne</td>
<td>7 - 11</td>
<td>56</td>
</tr>
<tr>
<td>St. Augustinegrass</td>
<td>Stenotaphrum secundatum</td>
<td>6 - 9</td>
<td>32</td>
</tr>
<tr>
<td>Seashore Paspalum</td>
<td>Paspalum vaginatum</td>
<td>6 - 8</td>
<td>32</td>
</tr>
<tr>
<td>Bahiagrass</td>
<td>Paspalum notatum</td>
<td>6 - 8</td>
<td>32</td>
</tr>
<tr>
<td>Kikuyugrass</td>
<td>Pennisetum clandestinum</td>
<td>6 - 9</td>
<td>32</td>
</tr>
<tr>
<td>Creeping Bentgrass</td>
<td>Agrostis Palustris</td>
<td>6 - 10</td>
<td>32</td>
</tr>
<tr>
<td>Centipedegrass</td>
<td>Eremochloa ophiuroides</td>
<td>5 - 9</td>
<td>32</td>
</tr>
<tr>
<td>Bermudagrass</td>
<td>Cynodon app.</td>
<td>4 - 9</td>
<td>32</td>
</tr>
<tr>
<td>Zoysiagrass</td>
<td>Zoysia app.</td>
<td>5 - 8</td>
<td>32</td>
</tr>
<tr>
<td>Kentucky Bluegrass</td>
<td>Poa pratensis</td>
<td>4 - 7</td>
<td>32</td>
</tr>
<tr>
<td>Buffalo Grass</td>
<td>Buchloa dactyloides</td>
<td>3 - 6</td>
<td>32</td>
</tr>
</tbody>
</table>

*Field grown under high evaporative demand conditions

Blends vs mixtures

- Blend
  - 2 or more cultivars of the same species
  - Increases disease tolerance etc.

- Mixture
  - 2 or more different species
  - Box store mix
  - KB and PR
  - KB and FF
  - TF and KB

Consumptive* (maximum) water use comparison

- Tall fescue: 3.6 mm/day, 100 inches/season
- K. bluegrass: 2.7 mm/day, 56 inches/season
- Buffalograss: 2.3 mm/day, 32 inches/season
- Zoysiagrass: 2.2 mm/day, 32 inches/season

Could come from precipitation, soil bank or irrigation....

Is the glass half full or half empty?
Relative Genetic Rooting Depth

- Buffalograss
- Zoysiagrass
- Tall Fescue
- Ky. Bluegrass

Mowing Height and Rooting Depth

As mowing height decreases, rooting depth also decreases and maintenance increases.

Seasonal Mowing Height

"set it and forget it"

Nutritional Value of Clippings

- 6-7% N
- 0.25 – 1% P
- 1 – 4% K

Returning clippings can reduce the annual N requirement by as much as 25%. Clippings also act as a temperature and moisture buffer.
Soil Solids 50%

45% Mineral Matter

5% Organic Matter

Pore Space 50%

Air 12.5%

Unavailable Water 12.5%

Available Water 25%

Ideal Soil Physical Composition
“To maintain optimal plant growth the entire volume of air to a depth of eight inches must be renewed every hour”

Layering
- Water and air movement is non-uniform
  NOT a function of drainage
  Rather it is the difference in pore size distribution among layers

Soil Infiltration and drainage
- Pores must be continuous and open to the surface – layers (and compaction) impede this process

Today's Discussion – Part 1 – Synopsis
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Todays Discussion – Part 2 – John

Efficient Irrigation Practices

- How to operate your irrigation system manually.
- How does soil texture and compaction affect irrigation efficiency?
- How to determine water infiltration rates.
- Effects of aeration on water infiltration.
- Why is overwatering bad for turf?
- Annual irrigation system auditing.