Turf Selection
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### Turf Selection Overview

#### Warm-season Species
- Bahiagrass
- Bermudagrass
- Buffalograss
- Centipedegrass
- Seashore Paspalum
- St. Augustinegrass
- Zoysiagrass

#### Cool-season Species
- Annual ryegrass
- Creeping bentgrass
- Fine fescue
- Kentucky bluegrass
- Perennial ryegrass
- Tall fescue

#### Species Strengths and Weaknesses

<table>
<thead>
<tr>
<th>Species</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahiagrass</td>
<td>Rapid growth, low N use, drought</td>
<td>Shade, salts, mowing frequency, lack of density</td>
</tr>
<tr>
<td>Bermudagrass</td>
<td>Heat, drought, traffic, disease</td>
<td>Shade</td>
</tr>
<tr>
<td>Buffalograss</td>
<td>Drought, Low input</td>
<td>Disease, moisture, traffic, fertilization, weeds</td>
</tr>
<tr>
<td>Centipedegrass</td>
<td>Low input</td>
<td>Traffic, salts, high pH, shade</td>
</tr>
<tr>
<td>Seashore Paspalum</td>
<td>Salts, traffic</td>
<td>Traffic, cold</td>
</tr>
<tr>
<td>St. Augustinegrass</td>
<td>Shade</td>
<td>Traffic, cold</td>
</tr>
<tr>
<td>Zoysiagrass</td>
<td>Heat, drought, shade, moderate traffic, cold, low input (Z. mertuska spp.)</td>
<td>Thatch, recovery rate</td>
</tr>
</tbody>
</table>

Prepared by Dr. Casey Reynolds.

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Cool-season species are not typically suited for Texas environments due to:

- Low water-use efficiency
- Low nitrogen-use efficiency
- Ideal temperature range of 60-75 °F
- High disease incidence
- Can lack rhizomatous and/or stoloniferous growth habits which allow them to recover from stresses associated with drought, pests, traffic, etc.
Bermudagrass

Excellent heat and drought tolerance
Easy to establish
Tolerant to a wide pH range
Respond readily to N fertilizer

Tifway 419

Released by Dr. Glen Burton in 1960
*Cynodon dactylon x Cynodon transvaalensis*

*Cynodon dactylon* – heat, drought, disease tolerance – 36 chromosomes
*Cynodon transvaalensis* – fine texture – 18 chromosomes

Texturf-10

Released by Texas Agriculture Experiment Station in 1957
More dense than common bermudagrass, less dense than Tifway 419

Latitude 36, Northbridge

Cold tolerance

Celebration

Shade tolerance
Seeded Bermudas

Yukon, Riviera
Seeded
Cold tolerance
Rapid greenup in spring
Good traffic tolerance

Bermudagrass

‘TifTuf’
(Experimental DT-1)

St. Augustine

Weakness
Cold tolerance

St. Augustine

Strength
Amerishade
Common
Raleigh
Floratam
DelMar
Palmetto

St. Augustine

Disease
Weakness

Chinch Bug Injury

St. Augustine

‘TamStar’
(Experimental DALSA 0605)

Drought Tolerant
Interploid Hybrid
Diploid x Polyploid

St. Augustine

‘TamStar’
(Experimental DALSA 0605)

Diploid – Texture, color, adapted for Southern U.S.
X

Field Response to Drought Stress
Starting July 20, 2013 - 55 days with 0.65” rain and Av. Tmx = 95°F

31 days of dry-down in 2015. Dallas, TX

Drought Tolerance

TamStar
Fioratam
Raleigh
Palmetto

42 days of dry-down in 2015. Dallas, TX
December 11, 2013
19 August 2014

TamStar Breeders' Field-Dallas

**Response to Freezing Temperatures**

TamStar– Highly Tolerant to Gray Leaf Spot Disease

TamStar– First Interploid Hybrid Commercially Available

- Drought Resistance
- High tolerance to Gray Leaf Spot
- Suppression of Southern Chinch Bugs (Antixenosis)
- Reasonable freezing tolerance
- Fewer seedhead production
- Highly Sterile—little to no off-types

**Freezing Tolerance - 2015**

2 years ‘no-maintenance’ – no supplemental irrigation, no fertilizer application, and exposure to freezing temperatures

TamStar Shows Antixenosis (reduced fecundity) Form of Resistance to Southern Chinch Bugs

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Total Nymphs</th>
<th>Total Adults</th>
<th>Total Bugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>DALSA0610</td>
<td>0.3 d</td>
<td>7.5 b</td>
<td>7.8 e</td>
</tr>
<tr>
<td>DALSA0008</td>
<td>0.8 d</td>
<td>7.5 b</td>
<td>8.3 e</td>
</tr>
<tr>
<td>DALSA0009</td>
<td>0.0 d</td>
<td>8.5 b</td>
<td>8.5 e</td>
</tr>
<tr>
<td>DALSA0005</td>
<td>0.0 d</td>
<td>9.8 b</td>
<td>9.8 e</td>
</tr>
<tr>
<td>Floratam</td>
<td>0.8 d</td>
<td>9.5 b</td>
<td>10.3 e</td>
</tr>
<tr>
<td>DALSA0002</td>
<td>6.3 c</td>
<td>12.3 ab</td>
<td>18.5 de</td>
</tr>
<tr>
<td>DALSA0007</td>
<td>10.5 c</td>
<td>9.5 b</td>
<td>22.3 de</td>
</tr>
<tr>
<td>Captiva</td>
<td>20.3 bcd</td>
<td>9.0 b</td>
<td>29.2 cde</td>
</tr>
<tr>
<td>DALSA0409</td>
<td>47.8 bc</td>
<td>15.5 ab</td>
<td>63.0 bc</td>
</tr>
<tr>
<td>DALSA0004</td>
<td>143.8 a</td>
<td>23.3 a</td>
<td>92.0 ab</td>
</tr>
<tr>
<td>Texas Common</td>
<td>54.0 ab</td>
<td>9.8 b</td>
<td>63.8 bc</td>
</tr>
<tr>
<td>Dalles</td>
<td>10.0 c</td>
<td>15.5 ab</td>
<td>118.5 e</td>
</tr>
</tbody>
</table>

* Values in a column followed by the same letter are not significantly different by Fisher’s Protected LSD Test (P < 0.05)

**Buffalograss**

Commerically Available in late 2016

**Floratam TamStar Raleigh**

2 years ‘no-maintenance’ – no supplemental irrigation, no fertilizer application, and exposure to freezing temperatures

TamStar– Highly Tolerant to Gray Leaf Spot Disease

TamStar– First Interploid Hybrid Commercially Available

- Drought Resistance
- High tolerance to Gray Leaf Spot
- Suppression of Southern Chinch Bugs (Antixenosis)
- Reasonable freezing tolerance
- Fewer seedhead production
- Highly Sterile—little to no off-types

**Buffalograss**

Likes higher height, needs N
**High Soil Moisture**

**Strength**
- Drought tolerance

**Weakness**
- Centipedegrass Decline
  - Probably not related to a fungal pathogen
  - Nematodes
  - pH above 6.0 (iron chlorosis)
  - Thatch problem
  - Waterlogged soil
  - Drought stress
  - Too much Nitrogen

**Centipedegrass**
- Performs best in well-drained, acidic soils
  - A very low input grass
  - 0-2 pounds of N per year

**Centipedegrass**

**Buffalograss**

Twogreenyaks.com
**Zoysia**  

**Strength**  
Density even with limited fertilizer

**Weakness**  
Slow growing, vegetative estab.

**Matrella Type**  
Slightly better shade tolerance

**Japonica Type**  
Better cold, drought tolerance

Traffic Tolerance  
Sumtersod.com

**Matrella Type**  
Can be mowed low

**Matrella Type**  
Should be mowed low
Dormant Color

Zoysia

Large Patch

Weakness

Matrella Type

Zeon
Zorro
Cavalier
Emerald

Japonica Type

Palisades
JaMur
El Toro
Empire
Crowne

Ryegrass Overseeding

Has functional benefit on Athletic Fields
Useful if there are many events in winter/spring
Improves wear tolerance in winter/spring
Provides a more playable surface

Ryegrass Overseeding

Not Cheap!

Seed
Fertilizer
Mowing
Irrigation
Transition herbicide
Fungicide?
### Ryegrass Overseeding

#### Annual Rye
- Germinates and grows most rapidly
- Coarse texture, light green color
- Transitions well
- Not usually suited for athletic fields

#### Perennial Rye
- Germinates and grows fairly rapidly
- Darker green color, fine texture
- Does not transition as well

### Ryegrass Overseeding

#### Intermediate Rye
- Traits of both annual and perennial ryegrass
- Color and texture may be suitable for many athletic fields
- Transitions better than perennial ryegrass
- "Turf Type Annual"
  - Panterra, Barenbrug SOS Blends

### Ryegrass Overseeding

#### Timing
- Early to mid October, depending on schedule
- Rate: 6 to 20 pounds per 1000ft²
- Depends on budget and expectations
- Can overseed multiple times throughout winter

### Ryegrass Overseeding

#### Prior to Overseeding
- Aerway or Vertical Mowing
  - Within 1 week before
- 4 to 6 weeks before
Apply Seed

Uniformity is important!

Go two directions

Irrigate

Mowing

Can begin as soon as you pull lightly on the leaf blade and it does not come up. Sharp blades

Fertilization

Do not fertilize bermudagrass heavily before overseeding

Generally 0.5 to 1.0 lbs of N per month

Depends on use. Can apply more in higher traffic areas

Quick-Release Nitrogen

Water-soluble

Ammonium sulfate
Ammonium nitrate
Diammonium phosphate
Urea

Slow-Release Nitrogen

Sulfur/poly-coated

Inexpensive form of slow-release
Ryegrass Overseeding

**Final Thought**

If you have not overseeded before, please consult additional resources before beginning an overseeding program.

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**Utah State: 2000-2003 Survey**

**Golf Irrigation Efficiency 80-88%**

~120,000 acres

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**Impact**

> 1.6 million acres

50%
Turf is the Largest Irrigated Crop

**Overwatering**
- Diseases
- Thatch
- Weeds
- Shallow Roots

**Drought Tolerance**

<table>
<thead>
<tr>
<th>Drought Tolerance</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Bermudagrass, Buffalograss</td>
</tr>
<tr>
<td></td>
<td>Zoysiagrass (Z. japonica)</td>
</tr>
<tr>
<td></td>
<td>Bahiagrass</td>
</tr>
<tr>
<td></td>
<td>St. Augustinegrass</td>
</tr>
<tr>
<td></td>
<td>Zoysiagrass (Z. matrella)</td>
</tr>
<tr>
<td>Low</td>
<td>Centipedegrass</td>
</tr>
</tbody>
</table>

**Underwatering**
SAWS Study
2007 and 2008
San Antonio

60 Days – No Water

20 days with no water

Species Comparison

13 20 27 33 40 47 55
Day of Drought

Leaf Filing (cm/mo)

9
Bermudagrass
8
Buffalograss
7
St.Augustinegrass
6
Zoysiagrass
5
4
3
2
1

47 days after water returned

Stolon

Where recuperative capacity comes from
Where recuperative capacity comes from

Rhizome

 Reality of Irrigation

“Footprinting”

Drought tolerance

Grasses can tolerate less-than-optimal irrigation amounts

How much water?
TexasAgTurf contains weather information, current and average evapotranspiration data, and irrigation watering recommendations.

**Current Stations:**
- Aggie Turf (current)
- Historic Stations: (latest stations)

You may select any of the stations below to view the station data. Click on the station on the map below, or login with your profile. For more information on why you should create a profile with Texas Aggie Turf, visit the NEW aggieturf.tamu.edu.

**McKinney Weather Station**
- Station Sponsored by: North Texas Municipal Water District
- Show Weather Data

<table>
<thead>
<tr>
<th>Date</th>
<th>FTA (in)</th>
<th>Temp (F)</th>
<th>Humidity (%)</th>
<th>Wind (mph)</th>
<th>Wind (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-9-19</td>
<td>0.55</td>
<td>70</td>
<td>30</td>
<td>1.74</td>
<td>1.40</td>
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<tr>
<td>2014-9-19</td>
<td>0.55</td>
<td>70</td>
<td>30</td>
<td>1.74</td>
<td>1.40</td>
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<tr>
<td>2014-9-17</td>
<td>0.31</td>
<td>82</td>
<td>32</td>
<td>1.54</td>
<td>1.35</td>
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<tr>
<td>2014-9-18</td>
<td>0.31</td>
<td>82</td>
<td>32</td>
<td>1.54</td>
<td>1.35</td>
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<td>82</td>
<td>32</td>
<td>1.54</td>
<td>1.35</td>
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</table>

**Total Summary:**
- Rainfall: 0.55 in.
- Temperature: 82°F
- Humidity: 32%

Note: Reported are the average values, not the absolute highs and lows.

Visit the NEW aggieturf.tamu.edu
Twitter: @mtelmore

Matthew.elmore@ag.tamu.edu