Sustainable Turf & Landscapes

Erwin McKone, CGCS
Home Lawns

- A dense, healthy lawn prevents run-off, absorbing rainfall six times more effectively than a wheat field and four times better than a hay field.

- Turfgrass helps control pollution, trapping much of an estimated 12 million tons (10.9 million metric tons) of dust and dirt released annually into the US atmosphere.

- The front lawns of eight average houses have the cooling effect of about 70 tons (68 metric tons) of air conditioning, while the average home-size central air has only a 3 to 4 ton capacity (2.7 to 3.9 metric tons).
Natural vs. Artificial

Safety Debate

- Cost
  - additional infill
  - irrigation because of unacceptably high temperatures on warm-sunny days
  - chemical disinfectants
  - sprays to reduce static cling and odors
  - drainage repair and maintenance
  - erasing and repainting temporary lines
  - removing organic matter accumulation.

- MSU $13,720-$39,220, typical annual maintenance costs of natural turf fields had a similar range of $8,133-$48,960
Great Turf Made Simple

- Cultural Programs
- Water Usage
- Plant Health
  - Bio stimulants
  - Precursors
- Nutrient Delivery
- Improved Chemistry
- Improved Application Techniques
- Genetics
Cultural Programs

Solid Foundation

- Managing Organic Matter
- Nutrient Testing
- Soil Structure
Water Usage

- Water Availability
- Water Uptake
Water Availability

**Making water wetter**

- Surfactants
  - Increase water penetration and water holding capacity
  - Chemistries to provide desired results over a wide range of soils
- Proper Fertilization
  - Potassium
Water Uptake

Roots

- Proper Cultural Practices
- Fertilization
- Bicarbonate issues
Plant Health

- Bio Stimulants
  - Products that impact the soil structure
    - Microbes
    - Humic acids
- Precursors / amendments
  - Amino acids
  - Seaweed extracts
  - Acilobenzolar
Nutrient Delivery

Nitrogen Cycle

- Issues
  - Denitrification
  - Volatilization
  - Leaching

- Stabilized Nitrogen

- Combination products
Improved Chemistry

- Low use rates
  - Increased Safety / Groundwater Concerns

- Specific target pest range
  - Reduced Non-target Pest Impacts

- Improved Formulations
  - Hydrophobic Ionic Liquids (Dicamba)
  - Combination products (abiotic and biotic stress) acilobenzolar
Improved Chemical Application

- Improved Nozzle Technology
  - Double Flat Fan
  - Air Induction
- Coverage Enhancing Products
  - Drift Control
  - Spreader / Stickers

https://youtu.be/DikptM98Wj0
Turfgrass Water Conservation Alliance

- TWCA Certifies specific varieties for their desired traits
- Varieties must be significantly different from traditional varieties
- 13 research collaborators across North America
- Must undergo 4 years of testing and all four years of data is used for certification
Rainout Building
Ratings

Figure 2 – Differences in % green turf coverage after 50+ days without irrigation
Interval Analysis

Figure 3. Confidence interval analysis demonstrating significant differences between bluegrass cultivars.
## ET Rates

<table>
<thead>
<tr>
<th>Day</th>
<th>Kentucky Bluegrass 2006</th>
<th>Evapo</th>
<th>ET Coeff. 0.5</th>
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<td>PST-99LM-15</td>
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<td>Geronimo</td>
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<td>Champlain, Eagleton, Blue Star</td>
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<td>Bedazzled, Americul, Moonstruck, Brooklawn, Julia, Royale*</td>
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<td>Mallard</td>
<td>7.79</td>
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</tbody>
</table>

### Variety Comparison

- **Total Geronimo**: 6.05
- **Total Mallard**: 7.79

**% Difference**: 22%
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