In with the New: BMPs for Regrassing Cool-Season Turf

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Primary Concerns Regarding Regrassing

- Killing a lot of turfgrass at once
- Cost / labor
- Player inconvenience
- Facility closure/lost revenue
- Consistency of germination and development
- Poa annua reinfestation

What we know about regrassing

- Non-selective herbicide required
  - Intraseeding into live stands with only cultivation or PGRs unsuccessful (Kandrick and Danneberger, 2005; Reicher and Hardebeck, 2002; Bauer et al., 2012)

- Seeding timing is critical
  - ABG competition greatest in September and October versus June or August (Murphy et al., 2015)
  - CBG germinates at higher soil temps than ABG (Engel, 1967)

Uncertainty in Key Steps

- Apply a non-selective herbicide
- Aggressive cultivation
- Drag to break up cores
- Remove any excessive debris
- Apply seed
- Apply starter fertilizer
- Lightly roll
- Irrigate lightly and frequently
- Post-renovation mgmt ABG control
Development of Fairway Renovation Strategies to Transition to More Sustainable Turfgrasses

1. Glyphosate application timing and seedbed preparation method on glyphosate efficacy
2. Seedbed preparation and seeding method on CBG establishment in mixed stand fairways
3. Effect of seasonal renovation strategies and post-renovation management practices

Materials and Methods

Seed bed prep method
- None
- Core cultivation
- Verticutting (VC)
- Core + VC

• Glyphosate timing (3.0 lbs a.i. per acre)
  - 7 days before seed bed prep
  - 5
  - 3
  - 1
  - 0

Glyphosate Efficacy
Core Cultivation + Verticut after Spray – 2015

• Non-selective eradicant
  - Glyphosate only applied 4 days before seeding
  - Glyphosate + Dazomet applied 3 days before seeding

• Seed bed prep method (3 days before seeding)
  - None
  - Core cultivation
  - Verticutting

• Seeding method
  - Slit seeder
  - Spike seeder
  - Drop seeder
  - No Seed

Study Design

DAS = days after glyphosate was sprayed
### Research Locations

<table>
<thead>
<tr>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wethersfield CC</td>
<td>Mohegan Sun GC</td>
</tr>
</tbody>
</table>

- Alan Woodward
  - Wethersfield, CT
- Chris Ellsmore
  - Baltic, CT

### Treatment Timeline

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Day</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glyphosate</td>
<td>Monday</td>
<td>8 Sept</td>
<td>14 Sept</td>
</tr>
<tr>
<td>Core cultivation</td>
<td>Tuesday</td>
<td>9 Sept</td>
<td>15 Sept</td>
</tr>
<tr>
<td>Verticutting</td>
<td>Tuesday</td>
<td>9 Sept</td>
<td>15 Sept</td>
</tr>
<tr>
<td>Dazomet</td>
<td>Tuesday</td>
<td>9 Sept</td>
<td>15 Sept</td>
</tr>
<tr>
<td>Seeding</td>
<td>Friday</td>
<td>12 Sept</td>
<td>18 Sept</td>
</tr>
</tbody>
</table>

### Day 1: Glyphosate Application

- 3.0 lbs a.i. acre⁻¹

### Day 2: Verticutting

- Graden SwingWing
  - 2-mm blades
  - 2-inch spacing
  - 2 directions

- 1-inch depth

### Day 2: Core Cultivation

- ToroProCore
  - 0.5-inch hollow tines
  - 1.5 x 2.0-inch spacing
  - 2-inch depth
Day 2: Incorporating Cores

Day 2: Finished Seedbed

Day 2: Dazomet Application

- Dazomet (Basamid) 257 lbs acre⁻¹
- Irrigation:
  - 1.0 inch—day of application
  - 0.5 inch—2nd day after
  - 0.2 inch—3rd day after

Day 5: Drop Seeder

- Creeping Bentgrass (0.5 lb 1000ft⁻²)
- 2 directions:
  - “007”
  - “13M”
  - “Barracuda”

Day 5: Spike Seeder

Day 5: Slit Seeder
% Green Cover: Influenced by Herbicide, Seeder Type and Core Cultivation

4 – DAIT 18 Sep 2015 (day of seeding)

3 – WAS 6 Oct 2015

4 – WAS 14 Oct 2015

5 – WAS 27 Oct 2015
Herbicide and Seeder Type Effects on Bentgrass Establishment

Turfgrass Composition

Annual Bluegrass  Creeping Bentgrass
Summary

- September challenging time for renovation
- Core cultivation or Verticutting occasionally improved CBG establishment
  - Verticutting also increased ABG contamination
- Seeder type had little effect on bentgrass establishment
- Applying bentgrass seed reduced ABG contamination, regardless of how it was applied
  - Little difference between Slit, Spike, and Drop seeders
- Dazomet (257 lbs/A) greatly improved CBG cover and reduced ABG cover in 2015, but had no effect in 2014

Seasonal Renovation Strategies & Post-renovation Management: Treatments

<table>
<thead>
<tr>
<th>Timing</th>
<th>Eradicant</th>
<th>Herbicide</th>
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<tbody>
<tr>
<td>July</td>
<td>Round-up</td>
<td>None</td>
</tr>
<tr>
<td>August</td>
<td>Round-up + Basamid</td>
<td>Prograss 3 pt/A</td>
</tr>
<tr>
<td>September</td>
<td>Tuesday</td>
<td>Prograss 4 pt/A</td>
</tr>
<tr>
<td></td>
<td>Tuesday</td>
<td>Velocity 6 oz/A</td>
</tr>
<tr>
<td></td>
<td>Friday</td>
<td>Trimmitt 1 pt/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bensumec 15 pt/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trimmitt + Bensumec 15 pt/A</td>
</tr>
</tbody>
</table>

Development of Fairway Renovation Strategies to Transition to More Sustainable Turfgrasses

1. Glyphosate application timing and seedbed preparation method on glyphosate efficacy
2. Seedbed preparation and seeding method on CBG establishment in mixed stand fairways
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Preliminary Recommendation

**September Seeding**

- September challenging time for renovation
- **Day 1:** Glyphosate (3 lbs a.i. / A)
- **Day 2:** Core cultivation
  - 0.5 inch tines; 1.5 x 2.0 inch spacing; 2 inch depth
  - Break-up / return cores
- **Day 2:** Dazomet (257 lbs product / A)
  - Irrigate according to label for next 3 days
- **Day 4:** Slit Seeder
  - At least 1.0 lb / 1000 ft²
Why “In with the new?”
The Environmental Impact Quotient (EIQ) is a formula created to provide growers with data regarding the environmental and health impacts of their pesticide options so they can make better informed decisions regarding their pesticide selection.

<table>
<thead>
<tr>
<th>Perennial rye Grass</th>
<th>EIQ</th>
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<tbody>
<tr>
<td>Annual bluegrass</td>
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<tr>
<td>Perennial ryegrass</td>
<td>661</td>
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</tbody>
</table>
Three methods of renovation.

- Done with existing equipment
- Nondisruptive, quiet and quick

Method 1
Roundup and wait two weeks as directed by label
15 pounds ryegrass seed and two applications of .5 pounds of nitrogen per 1000 square feet.

May 1

May 15

June 11
6 weeks after seeding

Method 2 (Autumn)
Roundup and start renovation the next day.

Use disruption for seed bed.
Prograss 2 weeks after seeding

6 weeks

Annual bluegrass
Method 3. Prograss. Verticut, topdress and seed the next day

APPLICATION RATES AND TIMINGS

<table>
<thead>
<tr>
<th>Grass Type</th>
<th>Main Target Dates</th>
<th>Start</th>
<th># Apps</th>
<th>Application Int (Days)</th>
<th>Use Rate</th>
<th>Overseeding Safety Interval (Weeks Before Treatment)</th>
<th>Application Safety Interval (Weeks After Emergence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kentucky Bluegrass</td>
<td>Spring</td>
<td>2-3</td>
<td>21-30</td>
<td>1/3 - 1 1/2</td>
<td>2 - 4</td>
<td>3</td>
<td>N/A</td>
</tr>
<tr>
<td>Annual Bluegrass</td>
<td>Fall</td>
<td>2-3</td>
<td>21-30</td>
<td>1/2</td>
<td>1 1/2</td>
<td>0</td>
<td>6</td>
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<tr>
<td>New Zealand Turfgrass</td>
<td>Spring</td>
<td>7-9</td>
<td>21-36</td>
<td>1/2</td>
<td>1 1/2</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Annual Bluegrass</td>
<td>Fall</td>
<td>2-3</td>
<td>21-30</td>
<td>1/2</td>
<td>1 1/2</td>
<td>0</td>
<td>6</td>
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<tr>
<td>Tall Fescue</td>
<td>Spring</td>
<td>2-3</td>
<td>21-30</td>
<td>1/2</td>
<td>1 1/2</td>
<td>0</td>
<td>6</td>
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<tr>
<td>Perennial Ryegrass</td>
<td>Spring</td>
<td>2-3</td>
<td>21-30</td>
<td>1/2</td>
<td>1 1/2</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

2 applications of Prograss, 10 weeks to 100% perennial ryegrass
9 weeks after seeding

Constant battle with Annual bluegrass.

Limiting water and fungicides helps, but chemical control necessary - Prograss, Trimmit, Xonerate

100% perennial ryegrass
Regrass
- Scalp low with mower
- Non selective herbicide
- Disrupt surface - aerify, verticut (this can enhance weed germination)
- Topdress
- Ryegrass seed
- Fertilize
- Keep moist
- Weed control
- Ready in 6 weeks!

Additional Considerations
- Thatch management
  - Challenging to drastically reduce thatch in one event
  - Medium-term approach focusing on spring & fall before
- Seeding rate?
  - Viable bentgrass seed outcompetes Poa
  - Cost / benefit
- Alternative species
- Is it worth the effort and money?
  - Water restrictions
  - Pesticide restrictions

Acknowledgements

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