Country Club™ MD

The Next Stage in the Evolution of Golf Course Fertilizers

Understanding the Country Club MD Product Line
What is Country Club MD?

Country Club MD is an innovative fertilizer purposely formulated to produce a highly dispersible particle that delivers superior turf quality and golf course playability through optimum nutrients and stress-buffering biostimulants in a single application.

Turf treated with sea plant kelp meal and humic acid will outperform untreated turf in overall quality and playability during stressful growing conditions.

Country Club MD products provide everything your turf needs to stay healthy all season long.
Granule Components

- Meth-Ex® is the slow release, methylene urea nitrogen source of CC MD

- Sea Plant kelp meal, containing multiple L-amino acids, helps the plant prepare for the onset of stressful conditions

- Humic Acid is the other biostimulant that serves as a soil microbial stimulator and organic chelator, which improves the plant’s ability to take up nutrients
When Country Club MD comes into contact with water, the particle immediately begins to breakdown and release the sea plant and humic acid, becoming immediately available to the plant.

The water color seen here in this demonstration clearly illustrates the particle dispersion of Country Club MD. The water turns brown due to the native dark brown color of the humic acid within every particle of Country Club MD.
Here is a close up of the SGN 40 and smaller particulates. The majority of these are tiny bits of WIN (Water Insoluble Nitrogen) methylene urea that supplies the slow release nitrogen component of the fertilizer that provides long-term nitrogen feeding to the turf.
• We produced 500 bags of 22-0-16 during the pilot production run to ensure we could consistently produce the SGN 80 granule on specifications

• Sent it out for testing to see what we had
  • University Performance Research
  • Virtual Focus Group
Performance Study - University of Illinois

Lebanon Performance Study Report
Tom Fernerian, University of Illinois
January 7, 2013

Experimental Layout

This experiment was designed to comparatively evaluate the performance of several fertilizer products on a stressed putting green turf. The study was conducted at the University of Illinois Landscape Horticulture Research Facility on a soil-based putting green growing 'L-90' creeping bentgrass (Figure 1). Soil at the site is a Flanagan silty loam soil (fine, montmorillonitic, mesic Aquic Argiudoll). The experimental design was a completely randomized block with four replications. Plot size was 5’ x 6’. A list of treatments is shown in Table 1. The description of fertilizer schedules and dates of application are further expanded in Table 2. The experiment was initiated on May 23, 2012. All treatments were weighed for an individual plot and applied by hand through shaker jars. Treatments were watered in with 20 min. of irrigation immediately after all treatments were applied. This same process was used for all subsequent applications. There were no pesticides applied to the greens during the course of the experiment. Irrigation was applied by schedule due to the sparse rainfall this summer. All plots were irrigated at night approximately 7 days per week. No other routine cultural practices were applied to the greens during the experiment. The greens were mowed 5 times per week at 0.125 inches.

Simulated Traffic

To apply some degree of stress to the experimental area all plots were periodically rolled with a smooth, unwrinkled roller. The roller was drawn by an EZ-Go golf cart, which also added some wear stress. All plots were initially rolled twice per week with two replications. This stress treatment began on May 29 one week after the initial treatments. After five weeks, the replications were increased to four until September 1 when all stress treatments were stopped to allow for evaluation of turf recovery.

Table 1. List of treatments.

<table>
<thead>
<tr>
<th>No.</th>
<th>Treatment</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Country Club 18.0-18-18 + sequalant</td>
<td>0.25</td>
</tr>
<tr>
<td>2</td>
<td>Country Club 18.0-18-18 + sequalant</td>
<td>0.5</td>
</tr>
<tr>
<td>3</td>
<td>Country Club 18.0-18-18 + sequalant</td>
<td>1.0</td>
</tr>
<tr>
<td>4</td>
<td>Country Club 18.0-18-18 + sequalant</td>
<td>1.5</td>
</tr>
<tr>
<td>5</td>
<td>Country Club 18.0-18-18 + sequalant</td>
<td>2.0</td>
</tr>
<tr>
<td>6</td>
<td>Country Club 18.0-18-18 + sequalant</td>
<td>3.0</td>
</tr>
<tr>
<td>7</td>
<td>Andersons DG 17-0-17</td>
<td>0.25</td>
</tr>
<tr>
<td>8</td>
<td>Andersons DG 17-0-17</td>
<td>0.5</td>
</tr>
<tr>
<td>9</td>
<td>Andersons DG 17-0-17</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Results

Data was collected weekly for a visual evaluation of turfgrass quality, color and/or injury. Additionally, a field scout TCM 500 NDP1 turf color meter was used to measure the reflective light energy on a weekly basis. During the first month of the study, clipping were collected 24 and 48 hours after treatment application and measured for dry clipping weights and any collected fertilizer particle weight.

Quality Ratings

All plots were rated for turf quality on 20 dates during the experiment. Statistically significant differences among the mean squares were found on only 4 dates of rating evaluation as shown in Table 3. The first date with a significant error mean square was on May 29, which was one week after the initial application of treatments. As expected the highest rate of application displayed the highest rated quality. The one exception was the 0.50-1000 kg/ha rate of Country Club + sequalant, which was also rated as having best quality among treatments. (Figure 2.)

Quality ratings

Table 2. Fertilizer application schedules.

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Description</th>
<th>Dates Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule A</td>
<td>0.25 lbs, nitrogen 1.000 sq. ft. applied on the 1st and 15th plus or minus one day of each month beginning May 15th and concluding on October 1st.</td>
<td>May 23, June 6, July 9, July 28, Aug. 6, Aug. 20, Sept. 6, Sept. 23, Sept. 28</td>
</tr>
<tr>
<td>Schedule B</td>
<td>0.50 lbs, nitrogen 1.000 sq. ft. applied on the 1st and 15th plus or minus one day of each month beginning May 15th and concluding on October 1st.</td>
<td>May 23, June 6, July 9, July 28, Aug. 6, Aug. 20, Sept. 6, Sept. 23, Sept. 28</td>
</tr>
<tr>
<td>Schedule C</td>
<td>0.75 lbs, nitrogen 1.000 sq. ft. applied on May 13, July 15 and September 15 plus or minus one day.</td>
<td>May 23, June 6, July 9, July 28, Aug. 6, Aug. 20, Sept. 6, Sept. 23, Sept. 28</td>
</tr>
</tbody>
</table>

Table 3. ANOVA error mean square significance for evaluations of turf quality, color and NDVI.

<table>
<thead>
<tr>
<th>Date</th>
<th>Quality</th>
<th>Color</th>
<th>NDVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>22-May</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>28-May</td>
<td>*</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>3-Jun</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>12-Jun</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>19-Jun</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>26-Jun</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>11-Jul</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>17-Jul</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>24-Jul</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>31-Jul</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>7-Aug</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>14-Aug</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>21-Aug</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>1-Sep</td>
<td>NS</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>4-Sep</td>
<td>NS</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>11-Sep</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>18-Sep</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>25-Sep</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>4-Oct</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>11-Oct</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS = not significant, * = significant at alpha = 0.05, ** = significant at alpha = 0.01.

Color Ratings

Ratings of turf color were also recorded on 20 dates during the experiment. On 15 of the 20 dates the ANOVA error means square was found to be significant. The first eight dates are displayed graphically in Figure 3 and the last seven dates are displayed in Figure 4. Generally, for ratings obtained in May or June only the 0.50-1000 kg/ha rates of any of the fertilizer mixtures were judged to have the deepest green color. In July as the season became more stressful the 0.50-1000 kg/ha were rated the same as the higher rates.

Figure 4 continues with ratings for August, September and October. These ratings are similar to earlier rating results, however, they generally reflect the effect of a recently applied fertilizer. By the conclusion of the study (October 10) only the 0.50-1000 kg/ha of other Country Club source had significantly greener color than the other treatments.

When the data was analyzed as a factorial arrangement (Table 3) plots receiving fertilizer in program C were not compared with all other treatments.
The following fertilizers were evaluated:

- Country Club 22-0-16 + sea plant
- Country Club Composite 18-3-18
- Andersons DG 17-0-17

**Phytotoxicity**
No phytotoxicity or injury was observed across the entire experimental area during the course of the experiment from any of the fertilizers tested.

**Quality Ratings**
There were very little differences among the three fertilizers with the exception of the Country Club + sea plant on July 17, which had a significantly higher turf quality.

**Color Ratings**
When the data was analyzed as a factorial arrangement, the Andersons fertilizer were consistently greener in color than the other two fertilizers until the beginning of August. On September 24, both the Country Club fertilizers were significantly greener or equal to the Anderson DG fertilizer.
Fertilizer Particle Retention

24 and 48 hours after fertilizer applications, mower clipping samples were collected for examination of the weight of the clippings and the amount of fertilizer particle picked up by the mower.

*Visual Examination* – Since the Country Club Composite particle was light in color, the data may be skewed due to easy recognition, however it had significantly more collected particles in the samples.

*Factorial Examination* – Country Club Composite fertilizer was rated to have more particles in the mower basket than either of the other two fertilizers. Country Club Composite also had significantly heavier particles weights on 25% of the collection dates then the other two fertilizers.

Recovery of Stressed Turf
The Country Club + sea plant fertilizer appeared to recover from stress injury more than the other two fertilizers.
Virtual Focus Group

Overview:

- Superintendent Magazine signed up nine Superintendents to participate in the VFG
- Superintendent participants received a bag of Country Club MD 22-0-16
- Applied at .75 N/M and reported back physical properties of product during application
- Followed up in 4 weeks to evaluate the agronomic response of the green from the fertilizer
- Reporting the following: what type of response have they seen with the green, color, appearance, playability, overall healthiness, would they use in their greens fertility program, would they recommend it to their colleagues, what would they change about the fertilizer, what analysis would be the most beneficial for them, what did they like best and least about the product
Virtual Focus Group

Participants

Bill Salinetti – National Golf Links of America – Southampton, NY
Bob Farren – Pinehurst Resort – Pinehurst, NC
Shawn Emerson – Desert Mountain Resort, Scottsdale, AZ
Matt Taylor – Atlanta Athletic Club/Riverside Course – Johns Creek, GA
Kevin Smith – Bryan Park Golf & Conference Center – Browns Summit, NC
Patrick Daly – Framingham Country Club – Framingham, MA
Craig Felton – Oak Hills Country Club – San Antonio, TX
Chris Carson – Echo Lake Country Club – Westfield, NJ
Mike Osley – Saddlerock Golf Course – Aurora, CO
“It seemed to push the grass and be a longer lasting response then I thought it would be. I applied it to a nursery green that was very hungry. It seemed to fulfill all its fertility requirements."
“Good color and recovery from aerification. Color is consistent over the 4 weeks. Color response was good even with high rate of Embark (1 oz. / 1000). I really liked its ability to melt into the canopy post application.”
“The product watered in/broke down really well and produced a really vibrant green color. Our density increased and the two greens looked the best they have in the 6 years that I have been working with them.”
LebanonTurf believes very strongly in unbiased university research.

We have three Ph.D.s on staff that conducts and manages our various research projects.

Develop research protocols and work with the universities to carry out the projects.
Mower Pickup Study - University Research

- Dr. Clark Throssell designed and oversaw these three research projects.

- University of Florida – Dr. Jason Kruse - Bermudagrass
- Purdue University – Dr. Cale Bigelow - Bentgrass
- Rutgers University – Dr. Jim Murphy – *Poa annua*

**Objective:** To determine the amount of fertilizer particles picked up by mowing after application of Country Club MD and Andersons DG.

- Four replications @ 0.5, 0.75, @ 1.0 lbs of N / M for all three CC MD products and the one DG product

**Dr. Throssell’s Executive Summary:**
- No significant particles were picked up from any of the products at any application rate
- There was no agronomic difference between any of the products tested across all sites
- Highest was 22-0-16 @ 1# of N – 1.13% - Lowest was 18-0-18 & 17-0-17 @ .5# of N – 0%
Stress Buffering Performance - University Research

• Dr. Clark Throssell designed and is overseeing these three research projects.
• Rutgers University – Dr. Jim Murphy
• University of Florida – Dr. Jason Kruse
• Clemson University – Dr. Bert McCarty

• **Objective:** To determine the turf response after application of Country Club MD fertilizer as it relates to both its initial ability to maintain high turf quality under environmental stress and its ability to recover and return to high turf quality after the environmental stress has ceased.

• Replications of CC MD 18-3-18 applied at .25 lbs. N / M on the 1st and 15th of each month beginning in April and ending in October – using various load levels of both humic acid and sea plant meal.

• Beginning in spring 2014 and concluding in the fall of 2015.
These biostimulants are “Elicitors”

- **Elicitors** – Elicitors are compounds, which activate chemical defenses in plants. Depending on the compound, various biosynthetic pathways are activated which initiate defense-related enzymes in the grass plant.

**Think of them like a “flu shot” for the grass**

- And like a flu shot, these elicitors must be activated **BEFORE** the onset of the stressful conditions.
But are Sea Plant and Humic Acid biostimulants important to golf course superintendents?
Sea Plant Survey – 2013 GIS – 500 Responses

What is your current position on the use of Sea Plant in golf course management?

- I believe in Sea Plant and currently use it. 147 – 29.4%
- I believe in Sea Plant but currently do not use it. 194 – 38.8%
- I’m skeptical about Sea Plant and currently do not use it. 127 – 25.4%
- I’m skeptical about Sea Plant, but do currently use it. 16 – 3.2%
- I think Sea Plant has no agronomic value. 8 – 1.6%

\[ \text{Total} = 68.2\% \]
What do you consider your current position on the use of Humic Acid for golf course management?

- I believe in Humic Acid and currently use it in my programs. 245 – 43.4%
- I believe in Humic Acid, but currently do not use it. 127 – 22.5%
- I’m skeptical about Humic Acid and currently do not use it. 131 – 23.2%
- I’m skeptical about Humic Acid, but do currently use it. 62 – 10.9%

\[ \text{Total} = 65.9\% \]
Competitive Advantages

• **Stress Protection** - The stress buffering biostimulants in Country Club MD will assist the turf in preparing for the inevitable periods of stress that comes in every growing season. These fertility and soil enhancers help putting greens achieve optimal performance by safeguarding the turf plant against biotic and abiotic stress conditions before they occur. This protection permits the putting greens to continue their high-quality playability for a longer period because turf treated with these biostimulants will outperform untreated turf in overall quality and playability once the onset of stress has occurred.

• **No Mower Pickup** – Country Club MD rapidly disperses into the putting green’s canopy after irrigation to virtually eliminate the possibility of being picked up by the greens mower during the next mowing. This delivery system ensures that the exact amount of nutrients you intended to feed your greens with actually become available to the turf.

• **No Particle Migration** – Due to its dispersion technology, Country Club MD moves into the turf canopy so efficiently that it practically eliminates the threat of particle migration in situations of over-watering or heavy rain events.
www.countryclubmd.com Website

• Dedicated website for CC MD Technology

• Populated with:
  • What is Country Club MD?
  • The “MD” Advantage
  • Products
  • Videos
  • Literature Downloads
  • University Research
  • “Real World” Golf Course Testing
  • Find Distributors
  • Education
  • Contact Us
Current Product Line

SGN 80 – Micro Greens Grade Products
- 11-7-21  60% Meth-Ex  2% Fe  1% Mg  1% Mn
- 12-0-24  65% Meth-Ex  1.6% Fe  0.5% Mg  0.5% Mn
- 12-24-8  40% Meth-Ex
- 14-7-14  70% Meth-Ex  2% Fe  1.5% Mg  1% Mn
- 16-0-8   Ammoniacal  1% Fe  1% Mg  0.5% Mn
- 18-0-18  64% Meth-Ex  1.6% Fe  0.5% Mg  0.5% Mn
- 18-3-18  78% Meth-Ex  1.5% Fe  0.65% Mg  0.5% Mn
- 22-0-16  64% Meth-Ex  1.6% Fe  0.7% Mg  0.8% Mn

SGN 125 – Micro Mid Grade Products
- 8-4-24   64% Meth-Ex  2.4% Fe  2% Mg  1% Mn SOP
- 16-4-8   70% AS  20% Meth-Ex  1.6% Fe  0.8% Mg  0.5% Mn SOP
- 18-0-18  69% Meth-Ex  2% Fe SOP
- 21-0-15  90% Meth-Ex  3% Fe SOP
- 24-0-8   94% Meth-Ex  3% Fe  2% Mg  0.5% Mn SOP
Thank You

Christopher S. Gray, Sr.
Product Marketing Manager
Professional Fertilizers
LebanonTurf

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