

Influence of Management Practices on 'Diamond' Zoysiagrass and 'Mini-Verde' Bermudagrass Golf Greens

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The purpose of this research is to provide turfgrass managers with information regarding the management of 'Diamond' zoysiagrass and 'Miniverde' bermudagrass golf greens in the southeast. Therefore, the objective of the research is to determine the influence of four N rates, two topdressing programs, and two verticutting programs on turfgrass quality and recovery, ball roll, and thatch accumulation.

N Rates

N rates that are being evaluated during the study are 2, 3, 4, and 5 lb N/1000 ft² per year, applied as an 18-9-18 granular formulation and a 30-0-0 liquid formulation. Granular applications are made once a month April through September, and foliar applications are made twice a month June through August. Individual applications range from 0.3 – 1.00 lb N/1000 ft² and from 0.1 – 0.2 lb N/1000 ft² for granular and foliar applications, respectively.

Topdressing

Two topdressing programs are being evaluated during this study. Topdressing 1 is a light sand application, 0.01", twice a month in June, July, and August. Topdressing 2 is a heavy sand application, 0.03", once a month in June and August. A rotary spreader is being used to apply the sand.

Verticutting

Two verticutting programs are being evaluated during this study. Program 1 consists of a non-invasive 0.25" verticutting twice a month during June, July, and August. Program 2 consists of an invasive 0.50" verticutting once a month in June and August. A 15" wide Graden Verticutter is being used to make both the invasive and non-invasive cuts.

Whole Plot Treatments

1. 2 lbs N/1000 ft²/year
Topdressing 1
2. 2 lbs N/1000 ft²/year
Topdressing 2
3. 2 lbs N/1000 ft²/year (Granular Fertilizer Only)
Topdressing 2
Verticutting 2
4. 2 lbs N/1000 ft²/year (Foliar Fertilizer Only)
Topdressing 2
Verticutting 2

5. 3 lbs N/1000 ft²/year
Topdressing 1
6. 3 lbs N/1000 ft²/year
Topdressing 2
7. 4 lbs N/1000 ft²/year
Topdressing 1
8. 4 lbs N/1000 ft²/year
Topdressing 2
9. 5 lbs N/1000 ft²/year
Topdressing 1
10. 5 lbs N/1000 ft²/year
Topdressing 2

Verticutting treatments 1 and 2 are subplots within each whole plot treatment, except granular and foliar only treatments (#3 and #4) which receive verticutting 2 as a whole plot treatment

Additional Study Inputs

- Turfgrass mowing height is 0.125"
- Blanket Primo Maxx applications once in June, July, and August
 - 1st application – 6.0 fl oz/1000 ft² - 6/23/2009
 - 2nd application – 3.0 fl oz/1000 ft² - 7/28/2009
- Hollow tine aerification in September 2009 and May 2010

Data Collection

- Weekly visual quality ratings on a 1 to 9 scale (1=brown turf/poor quality, 6=acceptable green color/acceptable quality, and 9=dark green color/excellent quality)
- Weekly visual recovery ratings on a 0-100% scale
- Ball roll distance taken once in June, July, August, and September using a standard 36" Stimpmeter
 - 1st reading – 6/5/2009
 - 2nd reading – 7/10/2009
 - 3rd reading – 8/6/2009

- Thatch depth collected once in June, July, August, and September by taking 3 random core samples from each plot and measuring uncompressed thatch depth
 - 1st measurement – 6/4/2009
 - 2nd measurement – 7/9/2009
 - 3rd measurement – 8/5/2009

Preliminary Results

Since the study was initiated in late April the most evident differences are between the N rates. Visual ratings of turfgrass quality and verticutting recovery have shown that 2 and 3 lb N/1000 ft² per year are too low for optimal 'Miniverde' bermudagrass performance. Color ratings were consistently under the acceptable level and recovery one week after verticutting ranges from 40 – 60% for both the invasive and non-invasive treatments. The results also indicate that 2 lb N/1000 ft² per year is too low for 'Diamond' zoysiagrass, but 3 lb N/1000 ft² per year provides turfgrass quality at or above the acceptable level. 'Diamond' recovery has been acceptable, ranging from 80 - 100% one week after verticutting. The higher N rates, 4 and 5 lb N/1000 ft² per year, have provided excellent turfgrass quality for the 'Diamond' and above acceptable quality for the 'Miniverde'. To this point there haven't been any visual differences between topdressing programs, but there are considerable differences in verticutting programs. The invasive verticutting performed in mid-June significantly injured the 'Miniverde' despite N rate. Although it was performed twice in June, there was less injury from the non-invasive treatment. The lack of invasive verticutting in July has allowed the turf in those plots to completely recover, whereas, the non-invasive being performed twice has caused considerable damage, creating a substantial difference between invasive and non-invasive plots. Ball roll distances have increased more than a foot since the initial readings on June 5th, with the lower fertility treatments having almost a foot longer distance than the higher fertility for both grasses. 'Miniverde' thatch measurements have not increased since the first measurement on June 4th. 'Diamond' thatch measurements in both the low and high fertility treatments have increased 0.27".

