

June 8, 2012

**Windmill Ridge Golf Course
Monett, Missouri**

DATE OF VISIT: June 5th and 6th, 2012

PERSONS PRESENT:

Mike Knight, Golf Course Manager
Dave Gillaspay, Golf Course Superintendent
Michael D. Vogt, CGCS, CGIA

Overview of Greens Conditions

Upon arrival at Windmill Ridge Golf Course I made contact with Golf Course Superintendent Gillaspay and Golf Course Manager Knight.

Turf condition on greens continues to steadily improve. All of the efforts up to this time have paid dividends in a more improved population and density of the greens surfaces.



Figure 1 Green #9

In Figure 1, 9 green was in near perfect condition with all voids healed. Upon inspection of the root system a fibrous, dense root structure was observed 5 inches downward from the turf surface. The rest of the greens also show this same rooting which is critical for survivability during the next 100 days.

Overview of Greens Conditions (continued)



Figure 2 Number 11 green receiving sod plugs and topdressing

Even with improved conditions there remain areas on greens in need of attention, for this reason continued sod plugging should continue. In figure 2 the maintenance staff has installed sod plugs and is applying topdressing to smooth the greens surface on the freshly sodded areas.



Figure 3 Proper healing of sod plugs

Overview of Greens Conditions (continued)

In Figure 3 the red outline of the hexagon sod plug shows the growth and healing of the turf.

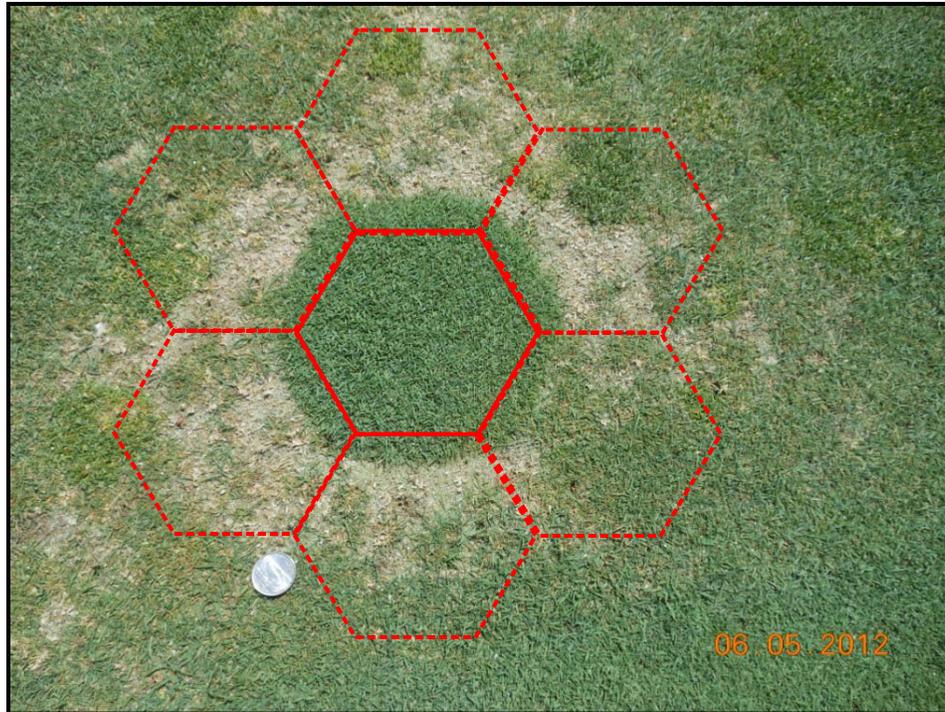


Figure 4 The hexagon plug area needs to continue into surrounding healthy turf

The hexagon plug in figure 4 is outlined in red; several other plugs (dotted red lines) should have been added adjacent to this lone plug to properly complete the job.

Water Management

During the months of June, July and August water management on greens will be critical. Careful water management is extremely important to golf greens. Daytime watering with overhead sprinklers for short run times should not be considered under any circumstance unless an overwhelming wilt situation is occurring without the required manpower to cool the greens and only until the plant regains normal turgidity.

Superintendent Gillaspay and I have discussed a water management strategy at length and have agreed that heavy periodic watering at night with overhead sprinklers, along with supplemental hand watering to cool turf and additional spot watering only dry areas on greens is very important for turf health during the next three months. Training of staff members is crucial to the success of this program of hand watering.

Venting Greens

Superintendent Gillaspay continues to vent greens as outlined in last month's report. Tine blocks on the machine were installed to add more tines and increase the number of vent holes per pass.

Venting of greens enables the root system to acquire oxygen and also aids in evaporative cooling of the root-zone. This practice should be continued as long as weather permits. The guidelines for venting during the extreme high temperature months are:

- Never vent when nighttime temperatures are above 85° F;
- Never vent when daytime temperatures are expected to be above 95° F;
- Be prepared after venting to apply hand water as needed, evaporation from the root-zone will likely be high;
- Never vent when turf is under stress, the mechanical damage could be greater than the positive effects of venting;
- Venting should occur early morning, when turf is less stressed by high temperature;
- Venting should not occur after 11:00 am on any day during June, July and August;
- Staff operating the venting machine should inspect the green for stress or mechanical damage before and after the venting process, in other words, **be cautious**.

Mowing and Rolling

A recent study at the University of Arkansas showed that at .125 inch mowing height, decreasing mowing frequency to 3 times per week actually increased ball roll distance (+ 1 ft.) when plots were rolled on alternate days. Ball roll distance (BRD) of greens mowed at .130 three times per week and rolled three times per week compared to .125 only increased BRD 6 inches.

This study is among many that advocate rolling as an alternative to dangerously low heights of cut during the stress periods of summer.

Another study showed that decreasing the mowing height from 5/32 (.156) to 1/8 (.125) inch increased green speed by an average of only 6 inches and, according to golfer perception surveys, golfers cannot detect differences in green speed of 6 inches or less on adjacent putting greens.

I recommend that greens remain at .140 of an inch, mowed three to four times per week and rolled on those alternate "no mow" days. This should give golfers a fine putting surface and should enable the turf to better survive stress periods.

By paying close attention to weather predictions a combination of rolling and mowing will relieve added stress to turf. The solid rollers added to the greens mower will also help alleviate side-slip bruising to the turf especially on the clean-up lap around the perimeter.

Mowers must remain sharp, dull or poorly sharpened mowers tear and shred grass blades rather than cut them. The damage to the turf from a dull mower increases the demand for water and nutrients. Mowers should be checked, adjusted daily and sharpened regularly to prevent unnecessary injury and to optimize turfgrass health.

During the remainder of June and during July and August it is important that each day greens be monitored several times after 10:00 am through 4:00 pm by maintenance staff trained in greens management.

June / July, 2012 - Greens Maintenance Schedule

6/10/2002	Fungicide and liquid fertilizer application-TBD	Roll no Mow		Roll no Mow	Tournament, Hot Rod Memorial June, 15th and 16th
WEEK 15				Vertical Mow one direction, 1/8 inch below level-then <u>Light Sand</u>	
6/17/2002	Roll no Mow			Roll no Mow	
WEEK 16	Vent Greens 1/4 inch needle tines			Vent Greens 1/4 inch needle tines	
6/24/2002	Fungicide and liquid fertilizer application-TBD	Roll no Mow		Vertical Mow one direction, 1/8 inch below level-then <u>Light Sand</u>	Roll no Mow
WEEK 17				Apply Cascade water heavy	
7/1/2002	Roll no Mow			Tentative/Weather	Roll no Mow
WEEK 18	Tentative/Weather Vent Greens 1/4 inch needle tines apply gypsum, Sea Blend 12-4-5, water heavy		July 4th	Finish-Vent Greens 1/4 inch needle tines apply gypsum water heavy	Spray .125 oz Primo / 1000 ft ²
7/8/2002	Fungicide and liquid fertilizer application-TBD	Roll no Mow		Roll no Mow	Tournament, NEA, July 14th, 15th
WEEK 19		Vogt Visit	Vogt Visit	Tentative/Weather Vertical Mow one direction, 1/8 inch below level-then <u>Light Sand</u>	
7/22/2002	Roll no Mow			Roll no Mow	Tournament, NEA, July 14th, 15th
WEEK 20	Tentative/Weather Vent Greens 1/4 inch needle tines			Tentative/Weather Vent Greens 1/4 inch needle tines	
7/29/2002	Fungicide and liquid fertilizer application-TBD	Roll no Mow		Roll no Mow	Tournament, NEA, July 14th, 15th
WEEK 21				Tentative/Weather Vertical Mow one direction, 1/8 inch below level-then <u>Light Sand</u>	

Rolling of greens should take place once during the weekend

The Six Basic Principals in Proper Greens Maintenance

To review on the building blocks to proper greens maintenance, these are the six best greens maintenance practices.

- **Mow properly**

You should routinely mow each turfgrass at its physiological optimum, taking into consideration its variety, local climatic factors and expected playing quality. For example, creeping bentgrass putting greens mowed at .125 inch showed a 40 percent reduction in photosynthates compared to greens mowed at .156 inch. The grass mowed lower was significantly less vigorous and not as healthy. Monitoring your turf density is a good way to assess optimum mowing height. Poor turf density is many times the result of excessively low mowing height.

- **Roll regularly**

Rolling will improve putting surface smoothness and firmness. The turf is much healthier when mowed higher and rolled compared to being mowed lower. Research shows that frequent rolling (even five times per week), will not cause compaction or other turf health problems. Rolling is a great way to get fast, smooth greens and still maintain healthy turfgrass.

- **Cultivate and vent frequently**

Putting greens produce the highest quality putting surface when cultivated and vented frequently. The best quality putting surfaces develop on greens when core aerified to 20 percent of the putting surface area each year. Vertical mowing and sand topdressing in conjunction with core aeration produce the best quality putting surfaces, resulting in firm, smooth, well-drained and fast putting surfaces. Putting greens with adequate routine cultivation venting maintenance, topdressing and vertical mowing have an unlimited life expectancy.

- **Apply turf growth regulators**

Applications of turf growth regulators are the new magic bullet for high-quality putting greens maintenance. Turf growth regulators that are safe for your putting surface turf species will increase putting surface density and smoothness while also eliminating *Poa annua* seeding.

The Basic Principals in Proper Greens Maintenance (continued)

- **Water properly**

Reduce overhead sprinkler irrigation by implementing deep; infrequent irrigation supplemented by hand watering of hot spots. If possible insure green surrounds are watered separately from putting surfaces. These procedures conserve water, increase surface firmness, reduce plant succulence and improve turf health.

- **Fertilize properly**

You should apply fertilizer only to meet the metabolic plant requirements. Excess nitrogen, for example, causes increased plant succulence, decreased drought and wear tolerance, and increased disease incidence and severity. The best putting green fertility programs apply required nutrients as foliar applied fertilizer at low rates to match the growing needs of the plant.

Conclusion

There are many factors that can be detrimental to the health of great golf greens. Many of them are very controllable by maintenance, while several factors are out of our control such as weather and the site the green occupies. There are numerous university studies that show that proper green location, morning sunlight and air circulation are some of these important factors that are out of our basic maintenance control.

Of all of these physical factors, morning sunlight and air circulation are factors that can be changed by the removal of trees and even the addition of air circulating fans built especially for golf greens. Perhaps a tree removal or heavy trimming program should be considered on several green sites at Windmill Ridge.

Promoting a healthier turf environment through improved air circulation and the alleviation of heat stress are the primary reasons most golf course superintendents use fans on their greens. Heat can have a devastating effect on putting green turf. When a green's subsoil temperature reaches high levels, turfgrass roots begin to shrink, diminishing the quality of the putting surface. Fan use can lower the surface temperature of a green up to 10° F, which in turn, lowers the soil temperature approximately 4° to 6° F.

Fan use increases turfgrass transpiration, cooling the plant internally and keeping it healthier overall. As an added benefit, fans can be used to evaporate excess moisture from heavy morning dew. As mentioned earlier thinning trees works best, but there is no disputing the fact that fans have shown to improve the quality of shaded greens.

Conclusion (continued)

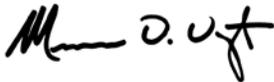
Greens conditions are in good condition going into the most severe time of the season. With proper, conservative maintenance and vigil monitoring, greens have a better chance of survival.

Each green needs to be monitored throughout each day by staff members that are trained in proper water management. Water applied to greens indiscriminately will have negative effects on turf survival.

My next scheduled visit is July 10th and 11th. During this visit we will examine how the renovation schedule is progressing and make any maintenance modifications if needed. We will also plan a greens maintenance program for the next 4 weeks.

Any questions or comments, please feel free to contact me at your convenience.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael D. Vogt". The signature is stylized and cursive.

Michael D. Vogt, CGCS, CGIA