

April 18th, 2012

Windmill Ridge Golf Course
Monett, Missouri

DATE OF VISIT: April 11th and 12th, 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 Mike Knight, Golf Course Manager and after greens observations, Golf Course Superintendent Gillaspay.



Photo 1 #9 Green

I was very encouraged to see much progress in density of turf on the greens in general. Sod work seemed to also be progressing at a good pace. Weather has been unusually warm for March and April with high temperature records being broken throughout the U.S. In Photo #2 annual bluegrass (*Poa annua*) has become a dominate species in some areas on that green. As stated in last month's report, there are rarely any greens that exist in this region that are ten years and older that do not have a certain percentage of annual bluegrass; the goal is to keep the populations of this variety to a minimum and slowly discourage its growth in favor of creeping bentgrass.

Although annual bluegrass is present the population is far less that I originally anticipated after the renovation process this spring and last fall.

Overview of Greens Conditions (continued)



Photo 2 # 16 Green, red circle indicates one annual bluegrass area

Sod Installation on Greens

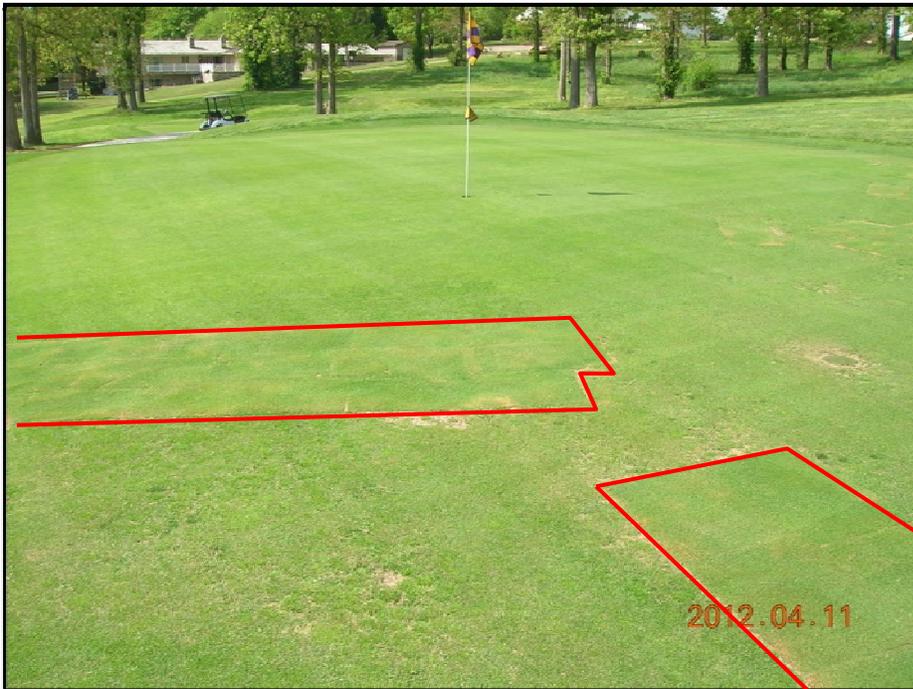


Photo 3 Sod installation on #2 green

On greens #2, 6, 8, 10, 11 the majority of full roll sod was used to fill in the larger voids. A vibratory asphalt roller will be used to smooth the sod on these greens to achieve uniformity. Illustrated in Photo #3 is 2 green, with red lines outlining new sod installation. It may necessary to increase the height of cut slightly (.140 of an inch) to aid in the establishment of new sod. If newly installed sod is mowed too low the chances of survival is diminished, this increase in height of cut is temporary and may be lowered within two weeks in small increments to a height of .135 then to .130 of an inch. Vertical mowing of new sod should not take place at least for one month after installation. Greens areas that have not received sod can be vertical mowed as usual. The vertical mowers should be bench-set at even with rollers for all greens surfaces for this spring. Deep vertical mowing into the crown area of the plant will retard growth and physiologically injure the turf plant. Vertical mowing should only be used to thin leaf blades at this time and not reduce thatch or cut into the crown portion of the plant during this spring and summer.

Pentagonal plugs are being used to repair smaller voids. This practice of plugging should continue as needed.



Photo 4 Pentagonal plugs being used on greens

It's important to know that these plugs are very appropriate to be used in this matter but they should be used to fill voids and eliminate annual bluegrass encroachment. The plugs should be installed to butt edge-to-edge (Figure #1); gaps between plugs will slow the total repair process. It is also very critical these plugs receive adequate water and are installed perfectly level. A simple 2x4 to use as a level guide can help achieve the plug is level with the surrounding turf.

Sod Installation on Greens (continued)



Photo 5 Bentgrass stolen growth

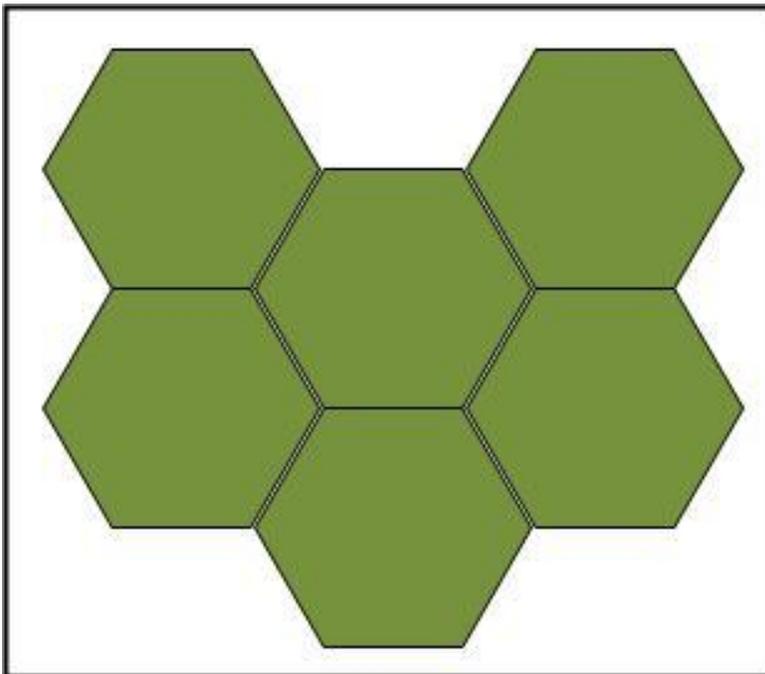


Figure 1 Installation of pentagonal plugs on greens

Sod Installation on Greens (continued)

Although encouraging, bentgrass stolon growth is slow to fill and plugs should be used to repair areas that are typical (Photo #5 and Figure #1). The red arrow in Photo #5 shows a bentgrass stolon lying over the top of the folding knife on green 10, on new construction we would generally let these stolons “run”, to fill in voids, on greens that support play it’s more expeditious to simply plug areas like these.

Sand Topdressing, Crown Scalping and Growth Regulators

Liberal applications of sand to greens during this year should be avoided until fall. Light and frequent applications are far more effective to smooth greens and dilute thatch. When sand topdressing greens, sand should be applied lightly during early morning on days of anticipated light play. A small amount of overhead water should be used to disperse and move sand from the turf leaf blade. Triplex vibratory rollers can also aid the distribution of sand into the canopy. After venting and/or light vertical mowing would also be the preferred time for light sand topdressing.

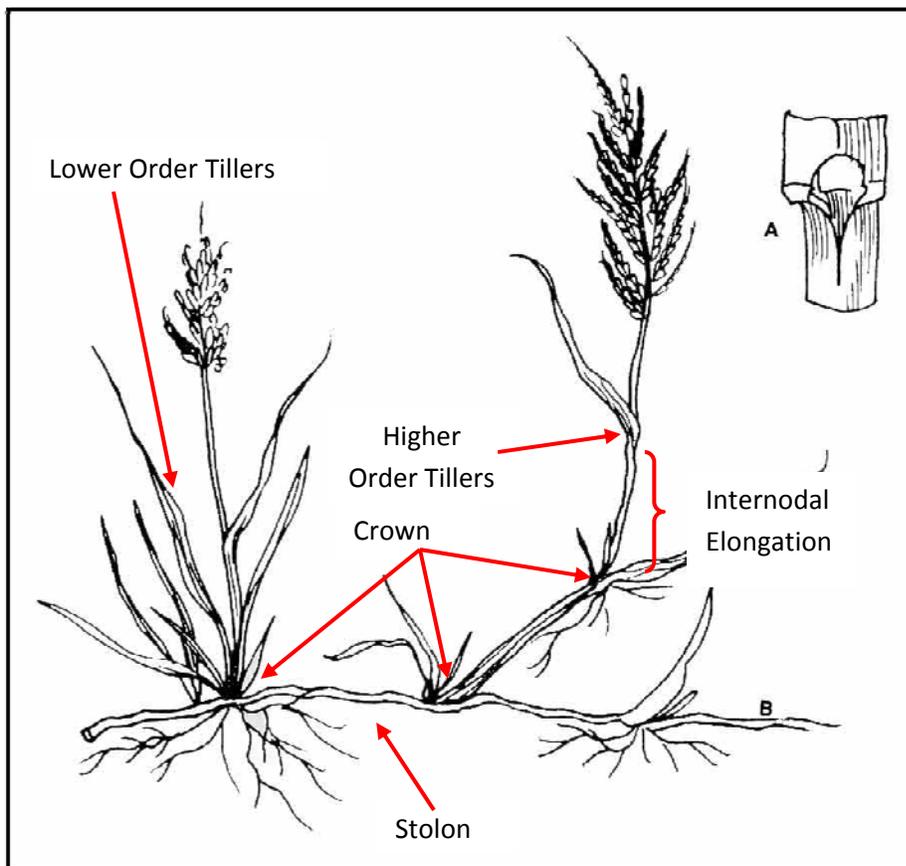


Figure 2 Bentgrass turf

Crown scalping can severely impact the health of turf. As a general rule approximately 3 to 4 live leaves occur per tiller (individual turf plant) regardless of density. Thus, the density of the turf is maintained through tillering. If we look at the primary tiller, it produces leaves and can also produce additional tillers from its base. Tillering is an organized system that is well structured.

Sand Topdressing, Crown Scalping and Growth Regulators (continued)

Tillers appear in a specific sequence and are influenced by the plant population density. Turfgrass tillers can be classified as lower order and higher order tillers. The lower order tillers are considered primary tillers that emerge close to the base of the primary tiller (near the crown), while the higher order tillers are produced from subsequent axils of later emerging leaves. Higher order tillers generally appear slightly higher in the canopy (see Figure #2). In dense turf, higher tiller orders tend to be smaller (maybe more succulent), more competitive for light, and predominate over the lower order tillers. Now, should these higher tiller orders elongate through internodal elongation (the distance between the tiller and the crown) the leaves associated with these tillers are raised higher into the canopy causing the turf to become scalped or what is often referred to as “puffy”.

Crown scalping may occur when any one of several factors occurs:

- High nitrogen fertility
- High moisture content of soil and interior of turf plant
- Excessive thatch
- Increase of tillering of higher order tillers
- Growth regulation being diminished

Steps to take to reduce crown scalping:

- Reduce nitrogen fertility
- Keep greens as dry as possible without sacrificing health
- Do not use grooved rollers
- Light vertical mowing (emphasis on light)
- Slightly increase height of cut until conditions subside
- Do not mow “clean-up pass” each mowing
- Lightly brush greens to reduce grain
- Roll instead of mow

When daytime air temperatures are above 90° F - no sand topdressing should occur. If greens begin to show signs of scalping due to internodal elongation mowers should be raised and every effort should be made to dry out the greens surface. Often, when using growth regulators, greens grow out of regulation and a trampoline effect occurs causing a surge of growth and a subsequent scalp of the crown on the turf plant will occur. As mentioned earlier the area of internodal elongation is suppressed with growth regulators. An application of growth regulation chemical should be scheduled as soon as possible to slow the growth in conjunction with an increase in cutting height. In keeping with a strict 14 day spray schedule of Primo MAXX[®] (Trinexapac-ethyl) at a rate of .062 ounces per 1,000 ft² or 3 ounces per acre¹. To minimize possible turf injury, apply Primo MAXX[®] then wait at least 4 hours before mowing or mow first, wait at least 1 hour, then apply Primo MAXX[®].

Mowing the Triplex Ring

In an effort to give the turf a chance for recovery around the greens perimeters several recommendations should be considered:

¹ From time to time chemical manufactures change rates and/or formulations. Always read and follow all manufactures label directions for any chemical application.

Mowing the Triplex Ring (continued)

- Skip mowing clean-up lap on days when expected play is low.
- Mow greens with solid rollers on the cutting units
- Move wheel tracks right and left slightly with subsequent mowings
- Mow “clean-up” lap with walking greens mowers



Photo 6 Triplex Ring

In Photo #6 it's apparent that the triplex greens mower is the cause of slow turf recovery. The area of thin turf is the exact width of the tire tracks of the greens mower indicated by the red lines. Several greens at Windmill Ridge have this “triplex ring”. I recommend using only solid rollers on greens mowers at this time.



Photo 7 Solid roller (top) vs. grooved rollers

Mowing the Triplex Ring (continued)

In photo #7 you can see how aggressive the grooved roller is and a turning maneuver around the outside of a green can cause excessive wear on the turf from these grooved rollers sliding the ridges across the leaf of the turf. Grooved rollers also push or fold the turf plant's leaves and cause a crimping effect cutting into the lower portion of the leaf and/or crown. Windmill Ridge currently uses grooved front greens rollers on all greens.



Photo 8 Another example of "triplex ring"

Notice in Photo #8, the small round spots or turf highlighted by red circles is *Poa annua*, due to compaction and repetitive abrasion the bentgrass seed has not had an opportunity to germinate and compete with the *Poa annua*. The two parallel red lines in Photo #8 denote the mechanic damage due to repetitive mowing in the same pattern.

Schedule of Green Renovation Events

April / May, 2012 - Greens Maintenance Schedule

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
4/8/2012	Sod work	Sod work	Sod work		
WEEK 6		1 st Pre-Emerge Application Dithiopyr 1.12 OZ per 1000 ft ² s) Vogt Visit for April	Vogt Visit for April		Roller Delivered (Roll sod on greens) <u>Keep new sod watered</u>
4/15/2012	<u>Keep new sod watered</u>	<u>Keep new sod watered</u>	<u>Keep new sod watered</u>	<u>Keep new sod watered</u>	<u>Keep new sod watered</u>
WEEK 7	Roll sod on greens HOC Greens .140"	Roll sod on greens HOC Greens .140"	Spray Proxy 3 oz and Primo.125 oz / 1000 ft ² (Poa annua seed head control) HOC Greens .140"	High School Conference Tournament HOC Greens .140"	HOC Greens .135"
4/22/2012	Sod Plug Greens	Sod Plug Greens	Sod Plug Greens	Sod Plug Greens (ongoing as needed)	Tournament on the 28th →
WEEK 8	HOC Greens .135"	HOC Greens .135"	HOC Greens .135"	HOC Greens .135"	HOC Greens .135"
4/29/2012	VENT GREENS ¼" needle tines, light sanding	VENT GREENS ¼" needle tines, light sanding	Fungicide Application Tourney, Medallion, and Daconil, CPR, Ca, P, K, Mg, Mn	Spray Proxy 3 oz and Primo.062 oz / 1000 ft ² (Poa annua seed head control)	ARC of the Ozarks Tournament
WEEK 9	HOC Greens .135"	HOC Greens .135"	HOC Greens .135"	HOC Greens .135"	HOC Greens .135"
5/6/2012	2 nd Pre-Emerge Application Dithiopyr 1.12 OZ per 1000 ft ² Sod Plug Greens	Vogt Visit (Tentative) <u>Evaluate Programs</u>	Vogt Visit (Tentative) <u>Evaluate Programs</u> Take soil samples (Logan Labs)	Roll Sod on Greens	
WEEK 10	HOC Greens .130"	HOC Greens .130"	HOC Greens .130"	HOC Greens .130"	HOC Greens .130"
5/13/2012	Fungicide Application Insignia, Daconil, CPR, Ca, P, K, Mg, Mn			Spray Proxy 3 oz and Primo.062 oz / 1000 ft ² (Poa annua seed head control)or Trimmit	
WEEK 11	HOC Greens .130"				
5/20/2012	VENT GREENS ¼" needle tines, once per month	VENT GREENS ¼" needle tines, once per month	<u>Light Sand after venting, Sea Blend, 12-4-5 >1/2 N/1000 ft²</u>		
WEEK 12					
5/27/2012	Daconil, 26019, 3336, CPR, N, N-P-K, K, Mg, Mn		3 rd (final) Pre-Emerge Application Dithiopyr 1.12 OZ per 1000 ft ²		Tournament
WEEK 13					
6/3/2012		Vogt Visit (Tentative)	Vogt Visit (Tentative)		Spray .125 oz Primo / 1000 ft ² or Trimmit
WEEK 14					
6/10/2012				Fungicide application and liquid fertilizer application-TBD	Tournament, Hot Rod Memorial 15th and 16th
WEEK 15					

Schedule of Green Renovation Events (continued)

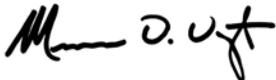
All of the operations outlined on the above schedule have been discussed and agreed upon in method, supplies needed and execution with Superintendent Gillaspy. It is our mutual opinion that this schedule will enable the best opportunity for recovery and sustainability of the greens turf surfaces at Windmill Ridge Golf Course. During the next five weeks weather conditions will vary and decisions on the greens renovations programs may not be perfectly aligned with the dates outlined, I will be in contact with Superintendent Gillaspy weekly to assist in scheduling these programs as needed.

Conclusion

My next scheduled visit is May 15th and 16th. During this visit we will examine how the renovation schedule is progressing and make any modifications if needed. We will also design a greens maintenance plan for the next 6 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 written in a cursive-like font.

Michael D. Vogt, CGCS