

April 29, 2013

**Windmill Ridge Golf Course
Monett, Missouri**

DATE OF VISIT: April 23rd and 24th

PERSONS PRESENT:

Justin Beck, Golf Course Superintendent
Michael D. Vogt, CGCS, CGIA

Overview of Greens

Turf on greens appeared to be dry and firm, excellent for this time of year. Although *Poa annua* was seeding slightly, greens had just been vertical mowed and seedheads did not contribute to overly “bumpy” green surfaces.



Photo 1 8.6 inches root depth, photo taken April 24, 2013, #16 green

Overview of Greens (continued)

Photo 1 Illustrates, a perfect example of the benefits of greens aerification. The bright white turf root has grown nearly nine inches below the turf surface, growing in the void left from the solid tine aerification. Increase root mass and depth will augment the turf plant's health and survivability during the stress periods of summer.

Poa annua

Due to the weather and turf sprayer problems, several applications to turf this spring have been missed. The products used to reduce *Poa annua* from producing excessive seed (Proxy®/Primo®) was applied slightly late, thus causing some seedhead production (Photo 2).



Photo 2 Large circle=Poa annua, small circles=Poa annua seedheads

The eventual elimination of *Poa annua* is the goal at Windmill Ridge. Since the window was missed in the application of the product to suppress seedhead production, a second strategy will be moved up, that is the growth regulation of the *Poa annua* plant. Paclobutrazol is a product that will suppress the growth of the *Poa annua* plant, while not necessarily effect the growth of the favorable bentgrass plant.

Poa annua (continued)

Trimmit[®] 2SC (Paclobutrazol) must be applied per all label directions, but the following are important to note:

- 0.10 pounds of active ingredient per acre or 6.4 ounces of actual product per acre;
- Do not apply this product on water logged soils;
- Assure that dosage rates are measured accurately, since rates greater than those recommended may cause undesirable turf growth control and may discolor areas temporarily;
- Do not use during periods of extreme dry or cold weather conditions, or during heavy insect or disease activity;
- Do not make more than 3 applications per calendar year;
- A repeat application within the same growing season may be made, but no sooner than 8 weeks following initial application;
- Additional soluble fertilizers may be needed to achieve an acceptable color on greens during regulation;
- After at least 4 weeks a second application of Trimmit may be applied; evaluation of this application should take place at 3 weeks after initial application.

Approximately six to eight weeks after the last application of Paclobutrazol to greens, a regular program of growth regulation with the product Trinexapac-ethyl (Primo Maxx[™]) may take place.

The green root-zone temperature was observed at near 70°F, this is perfect growing conditions. Superintendent Beck has scheduled an addition solid tine aerification on or about the first week in May along with heavy topdressing and an application of organic fertilizer. This program should bolster root growth and turfgrass health on greens.

Fairways



Photo 3 Weed problem fairway #5

Currently, many grassy weeds pose a problem on the fairway turf (Photo #3). An application of Revolver™ (foramsulfuron) herbicide should eliminate most grassy weeds currently present. It is very important to read all label directions before the application of this product. Serious injury of cool season grasses will occur if this product is tracked or spray is drifted off target.

Sand Bunkers



Photo 4 Greenside sand bunker #7

Although sand bunkers remain in less than perfect condition, many have improved by an increase in maintenance. The only solution to improving sand bunker condition is removal of old contaminated sand, renewing drainage, establishing a clean vertical edge and replacing with new sand.

Illustrated in Photo 4, the greenside bunker edge has collapsed. The sand is not necessarily poor, but the hazard edge is not well defined or manicured. Bunker renovation can initially be costly and very labor intensive, especially if performed correctly. The following ten steps in sand bunker renovation may be of interest or be used as a guide to insure proper methods are adhered to:

Step 1: Determine the reason for renovation.

You will eventually need to renovate all sand bunkers, although the reasons for renovation may vary from one hole to another. For example:

- Sand may be contaminated;
- Edges may be deteriorated;
- Construction may be poor;
- Drainage may be lacking.

Sand Bunkers (continued)

In many cases at Windmill Ridge, one or two of these problems may be incorporated with one or two of the others. So you typically don't have just one problem with which to deal.

Compounding the problem at Windmill Ridge, there are old-style sand-bunker designs, incorporating a relatively flat base. These bunkers are easier to maintain and typically have fewer problems, if adequate drainage has been installed.

Also at the course are newer style bunkers that flash sand up the bank (typically on the east side), most of these bunkers are shallow and elevated for easier visibility. These flash bunkers are susceptible to erosion, in turn, leads to sand contamination and washouts, that require hand labor to remove contaminated sand and shovel sand back onto the bunker's face after heavy or prolonged rainfall. These repairs can become a large expense and reduce the life span of bunker sand. This is especially true of poor reconstruction methods used.

Step 2: Contact a golf course architect.

Before you consider any major bunker relocations or renovations, make sure you involve a golf course architect, if possible. Bunkers influence playability, as well as overall interest in and the mood of a golf hole.

A good architect provides a great amount of consideration in determining the proper location of bunkers to equally challenge all players. Bunker placement can set up a hole to provide penal, strategic or heroic measures.

Step 3: Remove the sand.

Remove and discard all old sand or use it on other areas of the course, such as tees. Sand that is contaminated with organic matter, soil or other large particles has no place in sand bunkers.

Step 4: Identify the original bunker edge.

Keep in mind the original shape of the bunker can be several feet away from the existing edge. You can identify the old, original sand edge, which will follow the original contour of the bunker-by probing or digging. One superintendent told me he found some of his greenside bunkers were 10 to 12 feet off of the original bunker design. Of course, such differences have a great influence on the way golfers play the hole.

Step 5: Dig out the original shape.

Once you've established the original shape of the bunker, use a mechanical loader, such as a skid-steer loader, to dig the bunker back to the original shape.

Sand Bunkers (continued)

If the bunker is a greenside bunker and you don't have to remove much edge, it's likely that sand has accumulated on the green from sand shots blasted toward the cup. Several feet of sand can accumulate in this area given enough time. If this is the case, you'll have to take that section of the green down to its original level. In doing so, you'll solve several other problems on the green that you may not have attributed to your bunker's deterioration. For example, this buildup of sand typically causes the bunker's lip to gradually deteriorate. Plus, it causes turf to thin out in this area due to the droughty conditions the sand creates. Thus, to solve the problems, you must take the accumulated sand down to the original soil level. You'll need to first remove the sod, then remove the sand and then replace the sod.

Admittedly, removing a significant layer of the sand may give a very different look to the hole; one to which some golfers may object. So you should give some careful thought to this area's renovation. You may even need to add soil before you relay the sod

Step 6: Consider water movement into the bunker.

Water movement is an important concept to keep in mind when working on bunker faces. You can avoid surface runoff into bunkers by building a lip 6 to 12 inches high or installing an interceptor-drain at the top. This type of drain catches surface water before it reaches the bunker. To install it, use a 4-inch flexible ABS perforated pipe in a 6-inch-wide trench that is 16 to 18 inches deep. Fill it with 3/8-inch pea gravel. You then can connect this pipe to an existing drainage system. Allow the existing turf to grow over it naturally.

Step 7: Address edging problems.

Bunker faces are not the only aspects of a bunker that you must address during renovation. With the use of mechanized bunker rakes, many courses have experienced problems arising from their misuse. Specifically, the mechanized rakes tend to push sand to the outside over the edge, breakdown edges and remove sand from faces. In so doing, it becomes difficult to maintain a proper depth of sand and to tell when you are inside the hazard or outside of it.

Therefore, you must define and shape the fairway side of the bunker. The edge facing the direction of play should be approximately 4 inches below grade to allow for sand replacement. It is important that the back and sides are flush with existing ground level. This facilitates surface drainage and eliminates a vertical lip that can interfere with a golfer's swing.

Step 8: Re-establish bunker edges and banks.

You can use two methods to reinstall a well-defined border, which gives the bunker its final shape and aesthetic appeal.

Method 1: First identify whether your bunker is on a flat-or relatively flat-plane. If so, you can use strips of plywood or metal sheeting to support banks during turf reestablishment, if needed. Obviously, this method works best where your bunker needs little support.

Sand Bunkers (continued)

Method 2: For bunkers with large elevated capes and mounds (Photo 5), follow these steps:

- Fill burlap bags about three-quarters full with topsoil;
- Lay the burlap bags out to establish your edge;
- Fill between the bags with soil;
- Place sod on top of the bags, laying the sod over the rounded edges of the bags;
- Perform final edging after the turf has established rooting.



Photo 5 Using soil filled bags to reinforce a sand bunker edge

You can mold and move the burlap sacks to provide the precise, desired effect of the bunker. In time, the burlap deteriorates. In the interim, it does an excellent job of protecting the bunker from soil washing into the bunker.

Step 9: Install appropriate drainage.

Good drainage is essential for all areas of the golf course. Sand bunkers are no exception. Good drainage, in fact, is probably the most important step in bunker renovation. After all, a bunker that allows sand to wash from its faces is a bunker with a short sand life due to contamination.

Sand Bunkers (continued)



Photo 6 Proper drainage and a crisp edge in a renovated sand bunker

Step 10: Install the sand.

Remember, sand's playability is subjective. It is a good idea to develop a test bunker with locally available sand so that the bunker can be sampled by the golfers. The test bunker should be used for several months before a final decision is made. This will help form a general consensus that will be useful in the ultimate selection of the sand. Keep in mind, bunker sand becomes firmer over time, as it becomes contaminated with soil and organic particles.

Four inches of compacted sand will be suitable for most sand bunkers.

The approximate cost to renovate bunkers varies but a good rule of thumb with labor is \$1.50 - \$3.00 per square foot, depending on extent of the renovation, cost of sand and additional drainage that may be needed.

Tees

The condition of tees is much better than last year. An aerification and several vertical mowing's along with a proper fertilization program will increase density and give the player a good footing. A machine that preforms vertical mowing's on tees and fairways would be a recommended purchase in the near future.

Tees (continued)



Photo 7 Thatch Master 3 point hitch thatch remover

Photo 7 and 8 illustrates a typical 3 point hitch, tractor drawn, de-thatching machine for use on tees and fairways.



Photo 8 Vertical mower removing thatch on fairway turf

Greens Surrounds



Photo 9 John Deere 2653 utility mower, # 12 surround

Photo 9 illustrates the currently use John Deere reel type mower used to mow green surrounds. This machine does an adequate job but is in need of sharpening. A much superior machine would be a rotary type machine due to the variety of turf on the greens surrounds at Windmill Ridge.

Irrigation

Many irrigation heads remain low or not leveled. It is important that these heads be adjusted prior to the summer season.

Conclusion

The overall condition of the golf course looks to be good. As the spring progresses and additional labor is added some of the detail work will begin to get accomplished.

The greens have a slight seedhead flush and may exhibit a bumpy putting surface for several weeks. Lower heights of cut will not remedy this problem; it is my recommendation to continue mowing at .120 of an inch.

Trimmit[®] should be applied to greens, a maximum of 2 applications may occur during spring. A liquid fertilizer should be used to mask any discoloration.

The aerification on greens has proven to be a very successful program. One additional deep tine aerification should take place this spring with subsequent venting until weather conditions prohibit.

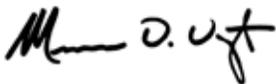
Fairways, although mostly dormant have a severe weed problem, especially #5, an application of Revolver[™] should eliminate most of the grassy weeds present. Aerification of fairways and tees should be scheduled as soon as Bermuda is actively growing.

Sand bunkers remain an issue. A plan similar to that outlined on pages 5-9 of this report would produce great results. At the very least, edging and removal of contaminated sand should occur, to bring these features back to acceptable playability.

My next visit in May will concentrate on maintenance practices recommended prior to summer conditions.

Any questions or comments, please feel free to contact me at your convenience, email mvogt@mcmahongroup.com or cell number (636) 448-0699.

Respectfully submitted,



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