

March 21, 2013

Windmill Ridge Golf Course
Monett, Missouri

DATE OF VISIT: March 12th and 13th

PERSONS PRESENT:

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

Overview of Greens

Upon my arrival at Windmill Ridge Golf Course I surveyed the greens with golf course superintendent Justin Beck and discover the greens over-wintered in generally good condition. Number two green remains the most troubled green on the course.

While no discernible voids exist on the second green the repairs from the last several years are apparent and remain less than smooth, taking away from quality cupping areas especially in the front right quarter of the green.

A standard soil profile was taken on several greens and healthy white conducting roots are present in substantial volume.



Photo 1 Green rooting, red arrow represents rooting depth

Soil temperature remains too cool to support aggressive root growth but I am encouraged to observe a 4 inch plus rooting on most greens sampled.

OVERVIEW OF GREENS (continued)

Aerification

Solid tine $\frac{1}{2}$ inch tine deep aerification will enhance additional rooting the coming weeks; this aerification is scheduled for March 18th and 19th with a portion of the work beginning on Sunday afternoon weather permitting.



Photo 2A test of the aerification method was conducted on the nursery green near the maintenance shop

In Photo 2, the distance between the arrows is approximately $3\frac{3}{4}$ inches. In my past visits we have demonstrated that establishing a dense and deep turf rooting system is paramount to healthy stress-resistant greens turf. In this aerification, creating thousands of these 7 inch deep, $\frac{1}{2}$ channels for air and water to enter the root-zone, the turf plant's roots will populate and thrive in these channels storing carbohydrates along with having a more efficient system for nutrient uptake.

OVERVIEW OF GREENS (continued)



Photo 3 Thatch amount just below crown (less than 1/2 inch)

In photo 3, the short red arrow indicates a very manageable thatch proponent of the root-zone. For this reason superintendent Beck and I concur, that core aerification is not indicated at this time. However, if thatch accumulation does occur in the future, core aerification will be necessary to mitigate upper level thatch and organic material. It should be noted, some thatch is required to act as a cushion to accept the ball onto the putting surface and absorb shock from ball impact leading to severe ballmarks. Thatch is the number one contributor to organic matter needed to balance soil exchange capacity and increase soil biologic activity.

Annual Bluegrass Control

Annual Bluegrass or *Poa annua* is a misunderstood turf species. Some varieties are true annuals, completing the life cycle on an annual basis; however, many species of *Poa annua* may be perennial biotypes.

With our understanding of turf and advances in management we can now care for *Poa annua* and even culture that plant to sustain playability throughout the season and greatly reduce the worst of seedhead production, the less than smooth putting surface that the *Poa annua* seed-spike produces for approximately two months every spring.

In years past during turf collapse on greens at Windmill Ridge, *Poa annua* encroached into greens. Now certain greens at Windmill Ridge have *Poa annua* populations near or exceeding 50%. Wholesale removal of *Poa annua* would certainly translate into very poor putting surfaces, it is the belief superintendent Beck and me that a less aggressive strategy would be best for Windmill Ridge.

OVERVIEW OF GREENS (continued)



Photo 4 Poa annua seedheads currently in the 'boot'

The spring program will consist of Primo® Plant Growth Regulator + Proxy® Herbicide for *Poa annua* seedhead suppression.

ANNUAL BLUEGRASS (*POA ANNUA*) OVERVIEW

Most all golf course superintendents who manage creeping bentgrass greens are often challenged by a seasonal invasive and strong competitor; *Poa annua*. Superintendents must decide whether to maintain the *Poa annua* or gradually reduce its population by using cultural and chemical methods to encourage much favorable bentgrass. One major challenge in managing *Poa annua* on greens is reducing the annual production of seedheads each spring. There are many annual and perennial biotypes of *Poa annua* as explained above, that are present on a single golf course. In general, annual biotypes produce more seedheads in a shorter time frame than perennial biotypes; Windmill Ridge has both annual and perennial biotypes.

OVERVIEW OF GREENS (continued)

PLANT GROWTH REGULATORS

Research at Penn State University on plant growth regulator (PGR) combinations by Dr. Tom Watschke, Jeff Borger, and Mike Soika was published in *Turfgrass Trends*, Feb. 2004, pages 78-81. Results from their research concluded that a spray combination of Primo[®] plant growth regulator and Proxy[®] herbicide consistently provided more than 85% suppression of *Poa annua* seedheads. Primo[®] (active ingredient trinexapac-ethyl) is foliar absorbed within one hour of application and reduces turf growth by slowing the production of gibberellic acid (GA1), a plant hormone that promotes cell elongation. Proxy (active ingredient ethephon) is foliar absorbed and promotes the production of ethylene. Primo[®] helps to slow growth and enhance stress tolerance on bentgrass and *Poa annua*, leading to more uniform turf that results in a putting surface that is faster with better ball roll.

TANK MIX: Primo PLANT GROWTH REGULATOR + PROXY HERBICIDE

Primo at 0.125 - 0.25 oz. /1000 ft² + Proxy at 5.0 oz. /1000 ft²

- 1st Application: 2-3 weeks prior to seedhead emergence;
- 2nd Application: 2-3 weeks following initial application;
- 3rd Application: If necessary, can be made if required.

After these Primo + Proxy applications paclobutrazol (trade name Trimmit[®]) may be applied until weather becomes consistently warm (85° – 90° F, high daytime temperature). Then if desired just Primo may be used to reduce growth, enhance summer stress and decrease low moisture stress.

Beginning in early fall (or during periods of suspected maximum annual bluegrass germination, which should coincide with active bentgrass growth), I would recommend the applications of paclobutrazol to stunt *Poa annua* until first hard frost. Additionally, you may decide to inhibit *Poa annua* seed germination in mid to late fall, an application of Bensulide (trade name Bensumec[™]), which is the most active pre-emergent herbicide against *Poa annua* seed germination. You may repeat this paclobutrazol application at 4 week intervals during periods of active bentgrass growth and annual bluegrass growth. Please keep in mind that the most beneficial effect from paclobutrazol is not necessarily plant death of annual bluegrass, but rather a very severe suppression of the plant. Repeated applications at 4 week intervals keep the annual bluegrass seedlings very small and they stay beneath the bentgrass canopy and should be out of play and not readily visible. Any perennial biotypes of annual bluegrass will also be suppressed but they will be visible and will be significantly discolored from paclobutrazol application.

It is of critical importance if you get into cold conditions in mid-winter and bentgrass growth slows or stops due to low temperatures, you must temporarily discontinue paclobutrazol applications during this period. Once you start getting some regrowth in late winter and clipping yields pick up, you can restart the program of paclobutrazol at 16 oz. /acre at 4 week intervals. It may be possible to complete several applications prior to seedhead reduction program as explained prior.

Normally, you will have to discontinue applications in late May or early June. In most springs, you can get in 3 to 4 applications.

OVERVIEW OF GREENS (continued)

I believe the following program to be the most effective registered treatment for annual bluegrass control on bentgrass putting greens. In my research, this program outlined below has resulted in 50 to 80% reduction of annual and perennial biotypes of *Poa annua*.

Another point to emphasize is the interaction of sterol-inhibiting fungicides and paclobutrazol. In hot weather (greater than 80° F degrees) paclobutrazol used in combination with these sterol-inhibiting fungicides (within 4 weeks of one another) can lead to severe bentgrass injury and perhaps even death. Care should be taken not to use these products together on bentgrass greens during periods of stress.

I want to emphasize a couple of points that I feel are absolutely critical for the program to work. You must make repeats at 4 week intervals in the fall. The effects of paclobutrazol last about 4 weeks and remember most of the control you are getting is from suppression (keeping the annual bluegrass below the canopy). Once the effect wears off, the annual bluegrass will resume growth and control will be lost. Another key is to be very careful on the first application after the first of the year (you may only get one application in before the seedhead program). Often times, annual bluegrass will begin growth before bentgrass. If you see indications that regrowth has begun, be prepared to make your first application right away, not a week later.

With respect to overseeding of bentgrass, I would recommend that whenever you overseed, wait a minimum of 4 to 5 weeks before your first application of paclobutrazol. This will ensure safety to young bentgrass seedlings. Therefore, it is important that overseeding occur in late August or early September so timely applications of paclobutrazol can be made by early to mid-October at the latest. Any aerification that occurs after the paclobutrazol program has begun should occur in the middle of a paclobutrazol application cycle (i.e. 2 weeks after/before a paclobutrazol application).

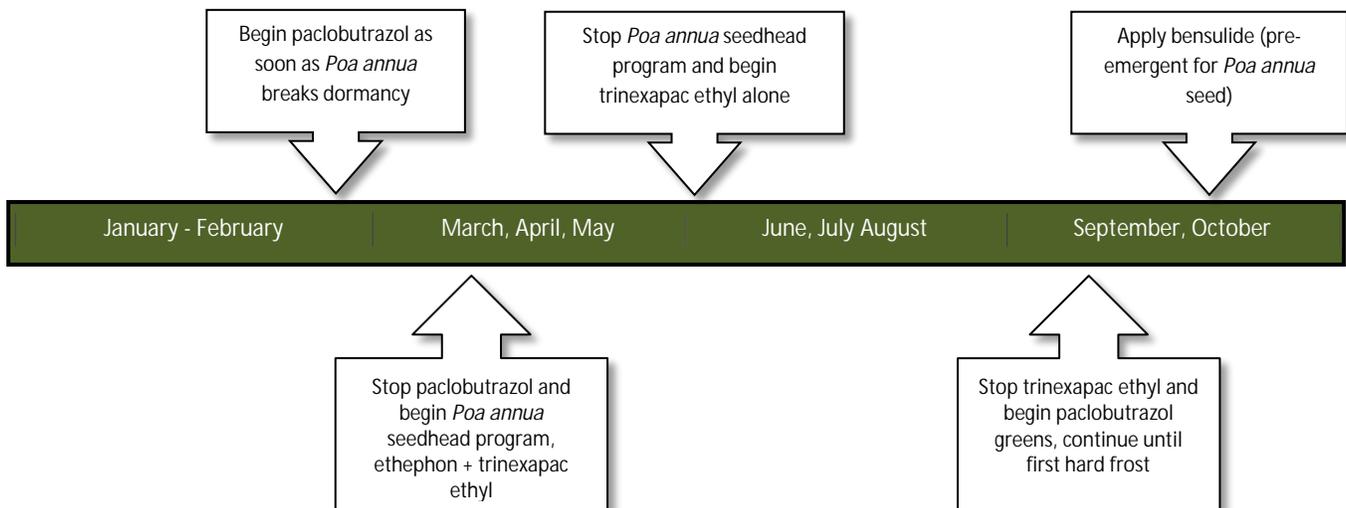


Figure 1 Approximate timeline for *Poa annua* control program on greens

OVERVIEW OF GREENS (continued)

Due to the many combinations of chemicals and strategies involved in *Poa annua* control and new chemistry available these recommendations should be fluid year-to-year. I have discussed these subjects with superintendent Beck, and the ultimate decision to timing is best left to him as weather, soil temperature, health of desirable turf and other maintenance strategies may conflict and changes based on these facts may come into play.

Tees

As of this writing all tees have received post emergent spray to kill winter annuals. As illustrated in Photo 5 timing and application rates are appropriate for good control.



Photo 5 Yellow plants indicates a good spray application to eliminate winter annual weeds

A plan to improve tee conditions is in place and consists of the following:

- Sodding selected tees to a more appropriate turf type-Zoysia in some cases of heavier shaded areas;
- Aerification and sand topdressing;
- Improved fertilizer applications.

Fairways

Fairway turf is currently in a dormant state. Planned applications of Glyphosate (trade name Razor®) and Prodiamine (trade name Barricade®) will be applied to control winter annual and select annual and perennial broadleaf weeds on the Bermuda fairway turf. Superintendent Beck has arranged to have the golf course fertilized with a commercial spreader with a proponent of the fertilizer impregnated with Prodiamine to control annual grassy weeds and selected broadleaf weeds. This pre-emergent application should contribute to a more weed free turf throughout the season.

Removal of tree in middle of #15 will need to have sod installed as soon as Bermuda breaks dormancy.

Bunkers

Since my last visit much work has been done on the sand bunkers at Windmill Ridge. Edges have been established and sand has been move into areas that have been washed out. Further work needs to be done; however, a good beginning has taken place on repairing the bunkers to date. It is my recommendation to enlist a qualified golf course architect before making any wholesale changes to or filling in existing sand bunkers. While most golfers as well as other practitioners in the golf business have opinions on proper placement and design, a truly good long range sand bunker strategy would include working with a qualified golf course architect. Using a golf course architect will remove the responsibility and/or blame from the golf pro, superintendent or anyone claiming to have the best interest of the golf course at heart by making modifications to the course and having the finished product resulting in less than acceptable in placement, playability or aesthetics.

A golf course architect may help with an overall sand bunker plan and could also be used to develop other long range plans that could include practice areas, new tee placements, contouring of fairway lines and tree planting. Local golf course architects would include:

- Todd Clark 913-621-5214 (ext.24) Kansas City, MO
- Stan Gentry 314-956-5281 Saint Louis, MO
- Randy Heckenkemper 918-628-1255 Tulsa, OK
- Art Schaupter 314-997-6229 Saint Louis, Mo
- David Whelchel 614-805-1660 Bella Vista, AR

Irrigation Repairs

Repairs to irrigation have been finished on #8 east green slope, what remains is a drain that has also been leaking in the same area.

A satellite controller remains to have communication problems on #7; it is thought that a communication module is the problem. These controller issues usually are a simple repair by replacing these modules with remanufactured circuit boards. A company by the name of Boardtronics has the best price and service available, their website is <https://boardtronics.com> or (800) 782-9938.

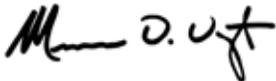
Conclusion

I was encouraged to notice that superintendent Beck has developed plans to improve all areas of the golf course in a systematic plan addressing areas that are of importance the golfing population at Windmill Ridge. A comprehensive plan over a measured period of time will result in the best possible outcomes, insuring each phase of the improvement will be done correctly and completely before moving on to the next project.

My next visit in April will concentrate on maintenance practices particularly turf nutrition and disease prevention.

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,

A handwritten signature in black ink, appearing to read "M. D. Vogt". The signature is fluid and cursive, with the first name "M" being the most prominent.

Michael D. Vogt, CGCS, CGIA