COURSE CONSULTING SERVICE

Onsite Visit Report

Recreation Centers of Sun City
Sun City, Arizona

Visit Date: September 28, 2018

Present:
Jerry Delano, Board President
Dan Schroeder, Vice President
Rich Hoffer, Director
Jerry Walczak, Director
Stella VanNess, Director
Dale Lehrer, Secretary
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The USGA Green Section develops and disseminates sustainable management practices that produce better playing conditions for better golf.

Background

Thank you for your kind hospitality and the opportunity to return to Recreation Centers of Sun City to conduct a Course Consulting Service visit on behalf of the USGA Green Section. It was good to see the golf courses at the end of September preparing for overseeding next week on some courses and the third week of October on the remaining courses. The bermudagrass in the fairways has recovered well from overseeding; however, there were reportedly some bare areas and thin turf following from overseeding in June and July. This same observation was common throughout southern Arizona this year on overseeded fairways when compared to the last few years. It was good to follow up on the topic of weeds in the nonoverseeded rough areas and that Specticle® preemergence herbicide was recently applied to all golf courses and a second application is scheduled for February 2019. Although Specticle is an excellent herbicide that prevents most weeds from germinating and maturing, some weeds may appear during the winter and spring and this report will provide several weed control options. It was also good to hear that the additional overseeded area in green surrounds was very well received by the membership and plans are in place to continue the program this fall.

Executive Summary

Much of the discussion during the visit focused on weed control, bunkers, improving bermudagrass transition from overseeding and the idea to evaluate new grasses and methods in which to establish new grasses into the existing common bermudagrass. Specific topics covered in this report include:

Putting Greens

Observations

1. **South Course.**

   - The 328 bermudagrass was in excellent condition on the South Course putting greens. It was good to see smooth and well-paced putting surfaces with an effective height of cut at approximately 0.110 inch. Of all my visits, these surface conditions are the best I have seen on the South Course.

2. **Lakes East and West.**

   - The 328 bermudagrass on the Lakes East and West courses is healthy with a robust rhizome population. Unfortunately, a strong population of green kyllinga has infiltrated Lakes East and West, but is more prominent on the West Course.

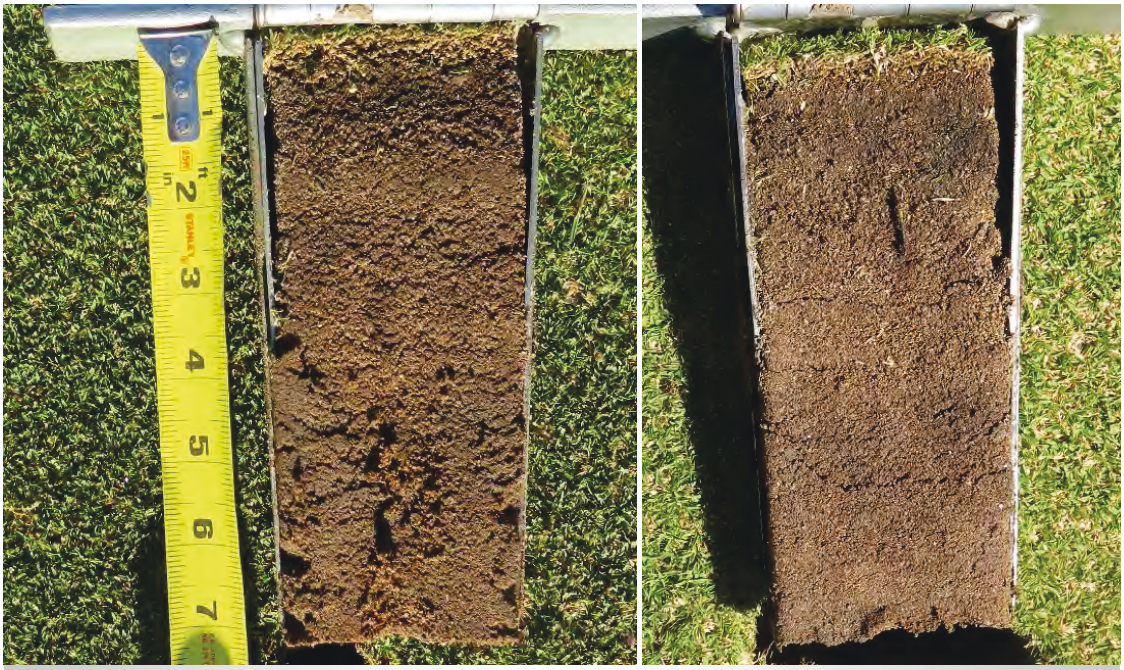
The darker green spots (yellow circle) contain green kyllinga (a weedy sedge grass).

   - Crabgrass was observed in localized areas in the Lakes East and West greens.
   - Despite a mowing height of reportedly 0.130 inch, the effective height of cut on Lakes East was approximately 0.140 inch, and it did not appear that the quality of cut was equal to that of the South greens.

3. **Soil samples.**

   - An ideal level of thatch was observed at the surface of each sample and it appears the aeration and sand topdressing program is working well.

     Soil profile samples collected from the greens of Lakes East and West and the South Course revealed three to four layers in the soil that restrict water movement and root development to some extent. Despite these layers, adequate moisture was found throughout the rootzone and the rooting depth extended to approximately 5 inches on all greens sampled.



(L) Soil profile samples from the South Course and (R) Lakes West revealed layers containing different levels of organic matter, soil texture and compaction levels. Although the layers restrict water and root development, each sample showed rooting depths of 5 inches or more.

4. Collar dams.

- Some raised collars (also known as collar dams) were observed surrounding some greens, especially on the South Course. These raised collars trap water on the surface of the greens and can negatively influence playability.

The collar area immediately outside of the putting surface perimeter is raised and traps water in localized areas on the greens

Recommendations

1. **Overseeding.**

   For the upcoming overseeding, it was good to hear that you will continue to use a mixture of ryegrass and *Poa trivialis*. Please consider the following best management strategies for overseeding putting greens:

   - Apply a growth regulator to the putting greens such as trinexapac-ethyl at a rate of 15 ounces per acre. Research shows the application can be made following scalping.
   - Use the vertical mower with the blades set approximately 0.050 inch below the bottom of the rollers. Use the backtrack method and switch directions three or four times, effectively making six to eight passes across the greens. Remove the debris and mow at approximately 0.100 inch to lightly scalp the greens.
   - Apply the seed in several directions.
   - Apply sand on top of the seed at approximately 150 to 200 pounds of sand per 1,000 square feet. Follow with brushing or use a similar tool in order to avoid any sand patterns from the topdressing machine.
   - Mow the greens from 10 to 14 days following overseeding with the initial height of cut at approximately 0.200 inch. The mowers must be perfectly sharp for the first mowing.
   - Apply Primo® to the greens 15 to 20 days following overseeding at a rate of 4 ounces per 1,000 square feet. Spray approximately every 10 days or every 220 Growing Degree Days at 4 ounces per acre until temperatures turn cold.

2. **Weed control.**

   - It is recommended to use the Andersons® Goosegrass and Crabgrass Control product in February and again in April on the putting greens to prevent crabgrass and goosegrass. These applications will also help control the green kyllinga on the Lakes East and West greens although it is not expected to provide significant control during the first year.

3. **Aeration.**

   - For summer aeration, it is recommended for all of the golf courses to employ a triple aeration process compressed into one week. A triple aeration should begin with a deep tine to penetrate 8 to 10 inches depth in greens with at least 1/2-inch diameter solid coring tines. Follow with two passes with 5/8-inch diameter tines on a 1.5-inch x 2-inch spacing. Combining three aerations into one week will minimize disruption to golfers and will achieve the agronomic goals to remove approximately 20 percent of the surface annually.
   - The deep tine aeration will penetrate the subsurface soil layers and create deeper channels. It is critical to completely fill the voids from aeration with sand and may likely require one or two additional topdressing applications.

4. **Mowing quality.**

   - The importance of mower reels that are properly adjusted and razor sharp cannot be understated. Every time the mowers leave the maintenance facility, the action between the reel and bed knife should be able to easily cut 20-pound paper. It is recommended to use a combination of grinding reels and bed knives along with back lapping to achieve a consistent quality of cut.

- It is recommended to set the mowers up in an aggressive manner with the thinnest bed knife. If possible, equip the mowers with 14-blade reels and consider raising the level of the rear roller (with a shim on the Toro® units) to position the bed knife in a more aggressive position.
- The article Managing Mower Setup to Achieve Quality Putting Surfaces and video Mower Setup Impacts Putting Green Surface Quality offer more information on this important topic.

Green Surrounds

Observations

1. **Bermudagrass recovery.**
   - It was good to hear that the added overseeding in the green surround areas was well received by the membership and the plan is to continue with this practice this fall.
   - It was reported that there were some thin bermudagrass areas in June/July following recovery from overseeding.
   - A relatively low height of cut of 3/4-inch was maintained in the spring, which allowed more sunlight penetration to the understory bermudagrass and expedited turf recovery.
2. **Weeds.**
   - An abundance of weeds were observed on all the golf courses including purple nutsedge, knotweed, crabgrass, goosegrass and spurge.

Recommendations

1. **Weed control.**

   Please consider the following strategies to enhance weed control in the green surrounds:

   - Beginning in mid-July, apply Monument® or Certainty® herbicide on the purple nutsedge and plan three or four additional applications spaced approximately three weeks apart. During this time of year, these herbicides will not damage the understory bermudagrass. Patience will be important given that a program of this magnitude will require approximately three years before there is a significant reduction in the purple nutsedge population.
   - For control of the crabgrass and goosegrass, plan to apply prodiamine at the highest label rate in February and again in April 2019.
   - Unfortunately, knotgrass is an extremely difficult weed to control given that preemergence herbicides have little to no effect on suppression; therefore, the program must rely on postemergence products. To have the best efficacy, these products must be applied early in the season when the plant is young and again late in the season when the knotgrass will be shifting its carbohydrate reserves to the underground plant parts.
   - Research shows that herbicide products, such as Fusilade II® (fluazifop) or Finale® (glufosinate), can be used effectively with multiple applications to control knotgrass, but not without some injury to the surrounding bermudagrass. Although spot treatment

with glyphosate can also a viable option, the best method for large areas of infestation may ultimately be sod removal.

- Purple nutsedge was observed in the green perimeter and in the raised collar immediately outside the green on the South Course. In this instance, consider removing the sod in the green perimeter and the raised collar followed by removing approximately 5 inches of material to mechanically remove the nutlets. Follow by adding a compatible mix to fill the void and then install sod.
- To treat khaki weed in the rough, spray a combined mixture of Gallery® at 1 pound per acre + Spotlight® at 1 pint per acre + Turflon Ester® at 3/4 pint per acre.

Khaki weed, knotweed, spurge, crabgrass and goosegrass contamination is impacting playing areas in the roughs and green surrounds.

Fairways

Observations

1. **General conditions.**

- The fairways on the South, Lakes East and West courses were in good condition on the day the course tour. However, there was some level of weed pressure and reports of poor bermudagrass recovery from overseeding on all three golf courses.

Recommendations

1. **Bermudagrass recovery.**

- Bermudagrass recovery from overseeding in the Phoenix area was generally poor in 2018 when compared to the past two years. Courses with hybrid bermudagrass that utilized proactive transition strategies fared better than those courses with common bermudagrass and lesser aggressive programs to expedite bermudagrass recovery.

2. **Transition strategies.**

The common bermudagrass at the Recreation Centers of Sun City has a longer dormancy period than hybrid cultivars and is slower to recover from overseeding. Several minor modifications and comments are offered below with regard to bermudagrass transition:

- Reducing mowing height is one of the keys to improve bermudagrass recovery from overseeding. In the spring, it is suggested to mow at a height between 0.350 to 0.450 inch. Most golfers of the maturing age prefer a slightly longer height of cut in order to sweep the ball from the turf; therefore, consider compromising to approximately 0.400 inch. This height of cut will allow some turf cushion while still allowing lower cutting heights that encourage sunlight penetration to the understory bermudagrass.

- Ample soil moisture in April through mid-June is critical. When temperatures increase in May and early June, it will be difficult to apply enough water to fairways to maintain adequate soil moisture without creating some wet areas. This is an important message to the membership – <u>it is critical to increase irrigation inputs from late April through June in order to provide adequate soil moisture across all overseeded areas</u>. Although it may be necessary to manage some wet areas, this is a worthwhile compromise given that this strategy will expedite bermudagrass recovery and provide better summer playing conditions.

- Beginning in February, conduct light vertical mowing on all overseeded areas. It was good to hear that each course will have its own fairway vertical mowing reels, which will help facilitate this important practice. As a guideline, the vertical mowing blades should be set about half of the mowing height. For example, if the fairway mowing height is 0.400 inch, the vertical mowing blades should be set 0.200 inch above the bottom of the rollers. This is not a thatch reduction strategy, but rather a simple way to thin the ryegrass canopy and slowly encourage more sunlight penetration to the understory bermudagrass.

- Use a chemical, such as Sapphire® , Revolver® or Monument®, at light rates through multiple applications to slowly remove the ryegrass and encourage the understory bermudagrass. The initiation of such applications should start in mid/late-April and continued at three- to four-week intervals.

- Given the level of purple nutsedge, Monument may be the logical choice to slowly discourage the ryegrass while offering some level of weed control.

Tees

Observations

1. **Weed populations.**

   - Similar to the green surrounds, high weed populations were observed in the tees and tee surrounds, especially on the Lakes East and West courses.

2. **Crowned tees.**

   - The tees on the Lakes East and West courses have become crowned over time and do not offer a level surface.

Recommendations

1. **Weed control.**
   - For the courses that overseed in late October, apply Certainty or Monument during the next few weeks to the tees and tee surrounds to damage the purple nutsedge.
   - Utilize prodiamine in February and again in April on the overseeded tees to help prevent the emergence of crabgrass and goosegrass.
2. **Tee leveling.**
   - When funds are available, tee leveling will be a necessary project on Lakes East and West. This practice is typically best completed utilizing an outside contractor. As an alternative, you may consider purchasing the laser leveling equipment, which could be shared among all the courses and tee leveling could become a summer project each year.

Roughs

Observations

1. **Mowing frequency.**
   - It was good to see more routine mowing in the roughs, especially on the South Course with 170 acres of rough area. Last year, golfers had difficulty finding their golf ball, much less being able to easily hit a recovery shot. This frustrated golfers and slowed play.
   - It was noted that the staff was able to mow roughs twice per week throughout the summer. Hiring an outside contractor to remove debris after the summer monsoons allowed the staff at each golf course to continue routine maintenance including mowing of the roughs.
2. **Weed populations.**
   - A high weed population was observed in the roughs.
   - The Lakes West Course has a high population of purple nutsedge and knotweed.

Recommendations

1. **Weed control.**
   - It was good to see that Specticle was recently applied to the nonoverseeded rough areas on all of the golf courses. Continue with your plan to schedule a second application in February 2019. Although this strategy will work very well, it will not control all weed species.
   - If winter weeds appear, use two to three applications of glyphosate at 12 to 14 ounces per acre. The first application should be conducted during the third or fourth week of December when the bermudagrass is mostly dormant. This is an inexpensive and effective method to control winter weeds.

Projects

Observations

1. **Turf reduction project.**

   - Although we did not have the opportunity to tour the areas during the visit, it was good to hear of the continuing turf reduction project on Willowbrook and Willowcreek. As noted in the last USGA visit report, this project will reduce 40 to 45 acres of turf between the two courses.

   - The board members, leadership and the agronomic team are commended for their ongoing commitment to reduce irrigated turf, which creates more visual interest of the property while significantly reducing water inputs.

A maintenance employee uses a line trimmer to cut the turf edge along the block wall of a residential home. This intensive and costly practice can be omitted from the budget following turf reduction.

Recommendations

1. **Reduce irrigated turf areas.**

   - When funds become available and the timing is right, move forward with your plans to reduce turf on the South Course. Irrigated turf could be reduced to only 80 to 90 acres thereby removing over 100 acres of turf. Although this project would be a big expense and would need to be completed in conjunction with an irrigation renovation project, ultimately, it would be a huge leap forward for this golf course.

2. **Explore new turf varieties.**

   - Newer grasses have the potential to retain year-round green color and exhibit some growth in the winter, which could eventually allow the golf courses to eliminate overseeding altogether. This would improve playing conditions for more golfing days per year and significantly reduce costs.

3. **Establish test areas.**

   The large area east of the turf care facility on the South Course would be an ideal location to experiment with new varieties of bermudagrass or zoysiagrass.
   Article: The Bermudagrass Line is Moving North in California

- Consider experimenting with possible methods to eradicate the existing common bermudagrass and sprig or sod with one of the new bermudagrass or zoysiagrass varieties as described in this article Golf Celebrates the Fruits of Research at UC Riverside Turfgrass Field Day.

4. **Consider the following strategies to incorporate the new desirable grass knowing that the window for the renovation period is about 90 to 120 days:**

   - Work backward from the renovation date and **spray the test area three times spaced approximately three weeks apart** with a combination of herbicides to kill or at least strongly suppress, the common bermudagrass.

   - Using nonselective herbicides, there should be three applications of Fusilade II® (23 ounces per acre) + Roundup® (3 to 4 quarts per acre) + Turflon Ester® (1 quart per acre) at three-week intervals. Apply 1 pound per 1,000 square feet of ammonium sulfate or urea after the first application to force rhizome regrowth in advance of the second application. These products will work best if applied at no more than 20 gallons per acre spray volume with twin flat fan nozzles (small droplets).

   - The article Bermudagrass Control: Basamid Treatment Regimens to Replace Methyl Bromide published by *Golf Course Management* magazine suggests "**Three fluazifop + glyphosate applications resulted in < 5% cover at the final evaluation date and should be considered for renovations where effective dazomet treatment regimens are not feasible.**"

5. **Options to mechanically disrupt the test area:**

   Option 1: Aggressively fraze mow with the goal to remove approximately 1.5 to 2 inches of material. This may require several passes with the fraze mower. Select an onsite location to dispose of the material harvested from the test site (the material will consist of live common bermudagrass rhizomes and weed seeds). Use a tiller, such as a Blecovator™ machine, to disrupt the top 2 to 3 inches of the surface to provide a good base for the new sod.

   Option 2: As an alternative to fraze mowing, you may consider renting or contracting a large roll sod cutter to cut/remove the sod and haul it away with small tractors and trailers. Use a tiller, such as a Blecovator machine, to disrupt the top 2 to 3 inches of the surface to provide a good base for the new sod.

   Option 3: Use an asphalt grinder to pulverize the soil to a depth of 4 to 6 inches following the three herbicide applications. This approach is less expensive, but does not remove any material. However, Mr. Mike Carlson, the golf course superintendent at Virginia Country Club in Long Beach, California, reported good results using this technique in 2015 and the Tifway II fairways are apparently free of common bermudagrass and are doing very well.

6. **Sodding the test area.**

   - Sod the test area with TifTuf, Latitude 36 or one of the new zoysiagrass varieties (consult with Mr. Jimmy Foxx at Evergreen Turf for commercially available varieties).

   - Once the sod has rooted into the soil, begin small diameter solid tine aeration to encourage rooting.

Bunkers

Observations

It is common for bunker lips to raise in elevation over time due to frequent sand splash, especially on bunkers that receive large amounts of play, such as those that are located short and right of putting greens.

1. **South Course.**

   - The bunker sand should be replaced on the South Course bunkers. A good time to lower bunker lips (where appropriate) and to replace sod on the bunker surrounds to reestablish a defined bunker edge would be during the bunker renovation project.

2. **Lakes East Course.**

   - Raised bunker lips and shallow sand were observed in localized areas.
   - Due to bunker sand splash on several bunker lips on Lakes East, there is a minimum of 7 inches of bunker sand material and likely another foot of sand material beneath.

This bunker lip is likely 16 to 24 inches higher since its construction. The raised lip creates a greater challenge than the original design intended and routine maintenance is more difficult.

(L) A bunker on the South Course has ample sand depth (left) with 6+ inches, while a low-lying area on the Lakes East Course (R) has only minimal sand depth. The shallow sand results in wet, firm conditions.

Recommendations

1. **Lower the bunker lips**

    - When funds are available and timing appropriate, it is recommended to renovate the South Course bunkers by replacing the sand, lowering the raised lips where appropriate and placing sod on the bunker surrounds to reestablish a defined bunker edge.
    - Although several bunkers can be renovated with "in-house" labor each summer, a larger scale project should be completed utilizing the services of a professional contractor.

Summary

Thank you for the invitation to return to the Recreation Centers of Sun City and discuss agronomic practices and long-range planning with the agronomic staff, course officials and board members. The upgrades to the infrastructure at these golf courses has been very impressive over the past five to six years, especially given that this occurred during an economic recession when many courses were simply huddling down to try and keep their doors open. Of course, there is future work ahead, including building a new turf care facility on Lakes East and West and upgrading the irrigation system and making significant turf reductions to the South Course. In the meantime, we will continue to work towards reducing inputs on golf courses and lowering costs while continuing to improve surface playing conditions down the middle of the golf courses. I trust the suggestions and contained in this report will assist your efforts in improving course conditions over the following months, and please do not hesitate to contact my office if you have any questions or concerns.

Additional Considerations

USGA Green Section Record

If you would like to receive the USGA's electronic publication, the *Green Section Record,* click here. It is free, informative and sent directly to you via email every two weeks.

Respectfully submitted,

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About the USGA Course Consulting Service

As a not-for-profit agency that is free from commercial connections, the USGA Course Consulting Service is dedicated to providing impartial, expert guidance on decisions that can affect the playing quality, operational efficiency and sustainability of your course.

First started in 1953, the USGA Course Consulting Service permits individual facilities to reap the benefits of on-site visits by highly skilled USGA agronomists located in Green Section offices throughout the country.