

COURSE CONSULTING SERVICE

Onsite Visit Report

SaddleBrooke Ranch Golf Club

Oracle, Arizona

Visit Date: December 4, 2019

Present:

Chris Blake, Golf Course Superintendent
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United States Golf Association

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The USGA Green Section develops and disseminates sustainable management practices that produce better playing conditions for better golf.

Executive Summary

The purpose of the Course Consulting Service is to collect and distribute information on the proper construction and maintenance of golf courses. Each visit offers an impartial yet concerned perspective regarding turfgrass growth requirements, practical information on maintenance practices to address your needs, and sharing information from other courses that we visit that may be helpful to your operation. This information is provided free of bias since the USGA is not affiliated with manufacturers or suppliers. In short, we are a tool to help your superintendent and management team provide better turf for better golf.

Thank you for the invitation to conduct a Course Consulting Service visit at Saddlebrooke Ranch Golf Club on behalf of the USGA Green Section. The following report will summarize the discussions following the course tour and discussion with the green committee and golfing members the morning of December 4, 2019.

This was my first visit to the golf course, and it was good to spend some time with Mr. Blake to learn about the challenges the agronomic team is facing with regard to improving course conditioning. There is a history of poor bermudagrass density on fairways and the conditions during the summer months have been a primary source of complaints by the golfing membership. However, it was good to hear that the membership is happy with the playing conditions of the putting greens. It is also good to report the health of the bermudagrass in the non-overseeded roughs has consistently been very good. The primary focus of this course visit was to understand the primary challenges to growing healthy turf on fairways and consider what the future holds for the best turf on putting greens. A brief summary of the topics discussed during this course tour is included below:

- **Fairways.** There is a history of poor bermudagrass on fairways and therefore, poor playing conditions during the summer months. The poor soil conditions have led to some of the decrease in bermudagrass health. In localized areas, the poor soil conditions also impact the overseeding quality. This report will provide an assessment of the current conditions as well as recommendations to improve conditioning to provide better year-round playing conditions. Additionally, this report will include a discussion about changing to a different type of grass for fairways.
- **Roughs.** It was great to see the health of the bermudagrass is excellent in the non-overseeded roughs. This report will strongly encourage the continuation of this practice and will offer some suggestions to improve soil health.
- **Putting greens.** The putting greens are overseeded with a combination of *Poa trivialis* and perennial ryegrass on top of the Tifdwarf bermudagrass base. It is good to see the greens were in good condition on the day of the course tour, and the greens have reportedly performed well over the past few years. This report will offer recommendations to continue to improve the greens and discuss the potential to regrass the greens to bentgrass.

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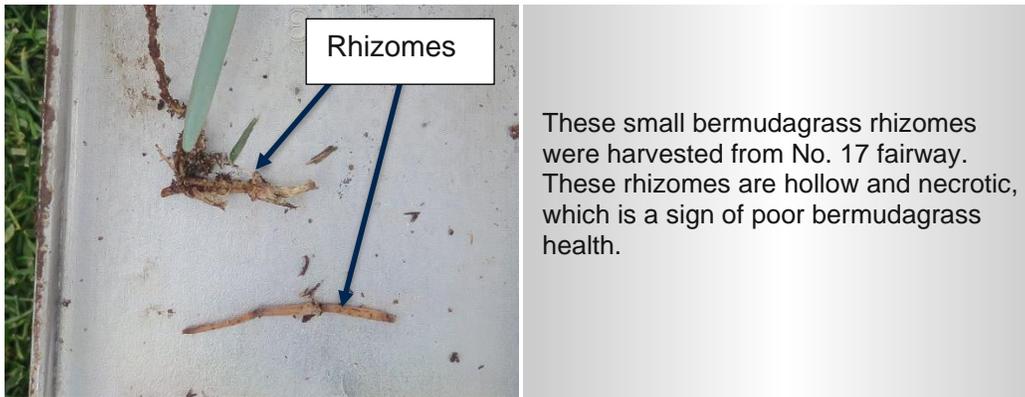
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Fairways

Observations

1. Poor Bermudagrass History

There is a history of poor bermudagrass health and density in the fairways. Soil profile samples collected on the day of the course tour revealed inconsistent bermudagrass rhizome health. The bermudagrass rhizomes are the critical part of the plant to enable regeneration each spring/early summer.

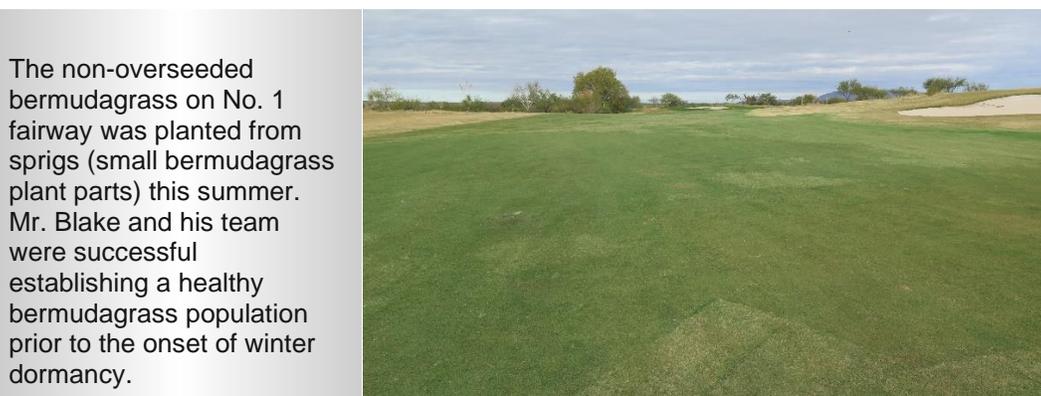


2. New Bermudagrass on No. 1 Fairway

Given the very poor bermudagrass base on No. 1 fairway, this fairway was sprigged with 419 bermudagrass this summer to reestablish a healthy base. The establishment of these new sprigs went very well, and it was good to see the health and density in early December.

3. Non-overseeded Fairways

Fairway Nos. 1, 3, 8, 11 and 13 were omitted from overseeding this year and have been treated with turf paints to provide a green color when the bermudagrass has gone into winter dormancy. In this agronomist's opinion, the color of the fairways was excellent on the day of the course tour and the playability of these fairways was excellent as well. This was an intelligent decision to not overseed a few fairways, especially No. 1 with the young, immature bermudagrass. Not overseeding will allow these fairways to regenerate a healthy bermudagrass base, although it will likely take two summer growing seasons to fully establish a healthier bermudagrass base.



4. Soil

The soil in most all fairways consists of a compacted decomposed granite-type of material with a very wide particle size distribution, ranging from fines such as silt and clay all the way up to larger-sized materials such as coarse sand, gravel and even small rocks.

- This widely distributed particle size range lends itself extremely well to heavy compaction. This was evident when collecting samples on the day of the course tour. It is likely that in heavily compacted areas, water moves through the soil extremely slowly at only 0.01 inch per hour. Not surprisingly, there is an accumulation of organic matter on top of this poorly drained soil at a depth of 2 to 3 inches.



The soil in fairway is widely graded and prone to compaction. Notice that in the top 2 inches is a dark layer of organic matter accumulation. This layer holds water and salts and will benefit from sand dilution.

- For an unknown reason, the clay soil on No. 10 fairway is quite different than the remaining fairways on the golf course. The characteristics of No. 10 fairway are preferred compared to the compacted decomposed granite soil.
- A handheld soil salinity meter revealed elevated salts at approximately 2 to 3 inches beneath the surface. The salt levels were not alarmingly high, but considering the irrigation water contains low salt content, it is clear that the salt accumulation is a direct result of the inability to adequately move water through the soils. Essentially, as the water sits at the surface of the soil, it is used up by the turf or evaporates and therefore leaves salts behind.

5. Irrigation Water

Recent water tests reveal the total salts in the water are low. Although the irrigation water may not be ideal, it is suitable to grow healthy turfgrass on this site.

6. Overseeding

It was great to see the quality of the ryegrass overseeding in the fairways in early December. In general, the weather this fall has been conducive to good quality overseeding and it will be expected for the quality of the ryegrass to continue to improve throughout the winter and early spring months. There were only small areas of localized ryegrass thinning, and these areas have already been addressed with mulch and seed.

Recommendations

1. Improving Soil Conditions

Above all else, it is imperative to improve the soil rooting environment to grow healthy turf on this site. Please consider the following strategies to improve the soil rooting environment:

- **Sand topdressing.** It was great to see that a sand topdressing program has already been initiated, and it is strongly recommended to continue. Ideally, the sand rate would be increased to 60 to 80 tons of sand per acre per year.
 - ◆ This sand may be applied throughout the entire fairway acreage; however, with budget limitations, you may consider concentrating heavier amounts of sand on more problematic fairways, or even strategic areas within fairways.
 - ◆ It is recommended to apply from as low as 5 and up to 20 tons of sand per acre per application and begin with lighter applications in March or April and continue through the summer months.
 - ◆ A heavier application such as 20 tons per acre can be made immediately prior to overseeding. Courses have found that the sand applied prior to seeding helps encourage the ryegrass seed germination and maturity.
 - ◆ It is also important to note that patience is important with expectations from the sand topdressing program. It is likely that significant improvement will not be clearly recognized until four to five years into the sand topdressing program. Additionally, it is not recommended to ever omit sand topdressing from fairways. It is critical to commit to the sand topdressing program for the life of the golf course.
 - ◆ Additional information on the benefits of sand topdressing to [Overcome Adverse Soil Conditions](#) is included here.

This profile was collected from a fairway at a course in Scottsdale, AZ following eight to nine years of routine sand topdressing. The soils at this course were very similar to those at Saddlebrook Ranch. Notice the dark organic matter layer at the 6.5-inch depth. This was the elevation at which the sand topdressing program was initiated. Now, over 6 inches of sand has been applied to improve rootzone conditions.



- **Aeration.** The quantifiable benefits from fairway aeration only last four to six weeks. As such, some form of aeration, whether it be hollow tines, solid tine, slicing or linear decompaction, should be performed eight to ten times per year, and even more frequently in localized compacted areas.
 - ◆ Continue to utilize the Wiedenmann™ machine outfitted with 3/4- to 1-inch solid tines two to three times per year, and more frequently in problematic areas.
 - ◆ It is also recommended to utilize the slicing machine which can be employed on fairways 12 months out of the year.
 - ◆ It is also recommended to consider the purchase of a new machine that conducts linear decompaction, known as the [Imants® RotoKnife](#). This machine can be outfitted with different-sized discs which can be used throughout the entire year and will cause minimal surface disruption. This is a machine that can be run 6 to 8 mph and can be utilized ahead of play in the morning hours. With the Wednesday course closure on nine holes during the summer months, this time will be extremely valuable to allow Mr. Blake and his agronomic team to conduct these important cultural practices.

2. Improving Bermudagrass Base

Improving the health of the bermudagrass base on fairways will require several steps over several years.

- The first step involves introducing new hybrid bermudagrass to the fairways, such as what was employed on No. 1 fairway this summer. Where there is similarly poor bermudagrass cover, these fairways should be identified and considered for sprigging in the summer of 2020 to reestablish a healthy bermudagrass base. Although this causes disruption to the playability of the golf course, it is absolutely worth the short-term pain for long-term gain.
- Secondly, a decision must be made with regard to overseeding fairways. There are five non-overseeded fairways this year. In the fall of 2020, you may consider not overseeding six fairways, and definitely the fairways where new bermudagrass is planted. A more aggressive strategy would be to not overseed all the fairways for the winter of 2020/2021, and again in 2021/2022. The end goal with regard to not overseeding the fairways is to reestablish a healthy bermudagrass base and build up a healthy population of the underground rhizomes. Once established, the option to continue with overseeding could be considered, or the membership may also consider eliminating overseeding on fairways. From an agronomic perspective, there is no doubt that eliminating overseeding will allow you to provide healthy bermudagrass year round. However, the winter dormancy will require painting such as on the five fairways not overseeded this year to provide green color. In high traffic areas, the bermudagrass density in its dormant state will decline, but will recover once growth resumes in the spring. In this agronomist's experience, courses in Southern Arizona that omit overseeding from fairways save between \$150,000 to \$250,000; however, these courses often lose more in revenue due to lost rounds from not overseeding as golfers generally focus on color and spend their money on courses with overseeded fairways.

3. Sand Injection

It is suggested to continue with your plans to inject sand into the fairways this summer. It is important to note that this practice will provide quantifiable benefits; however, it is not a strategy that will fix the fairways with one event and is simply a tool to use in combination with the practices described above.

4. Improving Transition

Part of the strategy to improve the bermudagrass base will be to initiate an aggressive, proactive transition program that begins early in the year to shift the competitive advantage from the overseeded ryegrass to the understory bermudagrass. This can be accomplished without compromising the golfer playing experience. There are four primary components of the proactive transition program:

- **Mowing height.** Maintain a low mowing height in the spring. Beginning in late February or early March, it is recommended to step down mowing heights on all overseeded areas to approximately 0.400 inch. Continue to reduce mowing heights in a stepwise fashion to a range between 0.300 to 0.350 inch on all overseeded ryegrass areas. This lower mowing height will help encourage more sunlight penetration to the understory bermudagrass.
- **Chemical transition.** It is recommended to initiate the first Sapphire® application approximately April 15 at 8 ounces per acre. This first application will slow the growth of the overseeded ryegrass without slowing growth of the bermudagrass. This application will not create poor aesthetics on fairways. This application stunts the growth of the ryegrass and will lower the mowing frequency rate. A second 8-ounce Sapphire application should be made four weeks after the first. Finally, a Kerb® application should be made four weeks after the second Sapphire application to finally remove all the cool-season grasses, including *Poa annua*. The combination of these three applications will slowly remove the ryegrass without creating a significant disruption to the playing surface.
- **Irrigation.** Beginning in mid-to-late April, it will be necessary to increase irrigation inputs, with the goal to avoid excessively dry conditions that will deter bermudagrass recovery. From mid-to-late April through late June, it is critical to increase irrigation inputs to approximately 100 to 110% of ET. While this may create some wet conditions with regard to playability, it is necessary to encourage bermudagrass recovery.
- **Fertility.** Approximately two weeks after the first Sapphire application, it is recommended to begin increasing nitrogen with a combination of soluble and slow-release sources. Soluble sources may include urea, ammonium sulfate or potassium nitrate. You may also include slow-release fertilizer, such as a methylene urea or stabilized form of urea. The Sapphire will allow for the increased nitrogen without creating undesirable ryegrass growth. Plan to apply approximately 4 to 5 pounds of nitrogen per 1,000 square feet from late April through early July to encourage bermudagrass recovery.

5. Long-term Vision

In the short term, Mr. Blake has already made good decisions to help encourage bermudagrass recovery. For the short term, it is recommended to continue with this plan and follow the recommendations described above. For the long term, there was some discussion whether it would be wise to switch to a cool-season grass surface such as bentgrass, ryegrass, or a combination with fine fescue.

- At this elevation, the cool-season grass scheme would work well; however, converting from bermudagrass to cool-season grasses would require course closure and significant soil modification.

- Other courses that have undergone similar projects have seen costs from \$25,000 to \$30,000 an acre. As such, costs for such a project would be estimated in the range of \$700,000 to \$1.2 million. Given the high cost and the disruption to the golf course, it is recommended to focus on improving the bermudagrass base, which will provide you with more options moving forward with regard to overseeding or not overseeding.

Roughs

Observations

1. Non-overseeded Roughs

It was great to see the roughs on the golf course have not been overseeded, and not surprisingly, the quality of bermudagrass in the roughs is excellent.

2. Weed Control

Mr. Blake and his team have done a fine job of controlling cool-season weeds in the non-overseeded roughs; however, it is impractical to eliminate all weed species and this will be an ongoing challenge.

Recommendations

1. Continued Non-overseeding

It is recommended to continue not overseeding roughs for the life of the golf course.

2. Cool-season Weed Control

Continue with your plan to utilize a combination of pre- and post-emergence herbicides. Given that weed resistance is a real concern, it is imperative to rotate chemistries every year and include both pre- and post-emergence products.

Putting Greens

Observations

1. Mixture of Grasses

The greens contain a Tifdwarf bermudagrass base overseeded with *Poa trivialis* and ryegrass. However, there is also a contamination of creeping bentgrass, more apparent on some greens than others. A good example is No. 11 green where there are many small patches of bentgrass.



The splotchy marks on No. 11 green are creeping bentgrass that was reportedly used for seeding several years ago.

2. Good Transition

It was great to hear that historically, the Tifdwarf bermudagrass has recovered well from overseeding each year. In fact, it was reported by several members at the member meeting that the greens continue to perform well on a year-round basis.

3. Soil Profile

Several soil profile samples collected from greens revealed a rootzone with no soil textural layers that would limit water movement and root development. It was good to see that the health and desirable performance characteristics of the sand rootzone remain intact. However, it was observed that there is excess organic matter in the top 1 to 2 inches of greens, which has made the greens somewhat soft underfoot. Furthermore, this excessive organic matter traps water and salts at the surface and can lead to bumpy conditions in the afternoon on busy golfing days.



It is good to see there is a healthy rootzone in putting greens with no restricting layers. Roots were found at a depth of 6 to 7 inches.

Recommendations

1. Organic Matter Reduction

Reducing organic matter in greens will require a combination of aeration, vertical mowing and sand topdressing. It is recommended to consider one core aeration event per year, conducted in mid-July. The steps involved with the core aeration event would look something like this:

- Begin with the most aggressive vertical mowing of the year, with the blades set approximately 1/8 inch below the bottom of the rollers. Utilize the back-track method with the vertical mower (up and-back on the same pass) and employ in two to three directions, effectively making four to six passes over the greens. Blow off the organic matter.
- Sand topdress greens at approximately three to four times the typical maintenance topdressing rate. The sand will help firm the surface and will significantly reduce rutting that is often associated with sand topdressing after aeration.

- Conduct the first aeration pass using a solid tine machine able to penetrate 8 to 10 inches beneath the surface. This is typically done with solid tines.
- Immediately after the deep tine event, conduct the first core aeration pass with 5/8-inch outside diameter tines on a 1½- by 2-inch spacing. Break apart the cores brought to the surface with a steel drag mat or utilize the vertical mower and blow off the organic debris.
- Finally, a second core aeration pass can be made approximately 24 to 48 hours after the completion of the first pass. Utilize the same tines and spacing and conduct at a 30° offset when compared to the first pass. Again, break apart the cores brought to the surface and blow off the organic debris.
- More than likely, the greens should receive two or three additional sand topdressing events to completely fill the holes to the surface.
- Many courses have switched to this type of aeration regime and have found that it succeeds in meeting the agronomic goals as well as reduces the disruption to the putting greens for golfers.
- Finally, most courses will close for five to seven days to allow the agronomic team to complete these intensive cultural practices.

2. Sand Topdressing

It is also recommended to increase the amount of sand applied to greens throughout the year. As a guideline, approximately 3,000 pounds of sand should be applied annually.

- This annual total can be achieved through a combination of the sand applied during aeration, at overseeding, and through routine sand topdressing events applied during the growing season.
- You may consider purchasing a less course sand for routine sand topdressing events during the golfing season. The Pioneer company offers a triple-wash sand, and West Coast Sand and Gravel and The Source offer sand that contains less fraction in the very course particle size range. Sand topdressing with these materials will provide better playing conditions and will incur less damage to mowing equipment.

3. Bermudagrass or Bentgrass?

There was healthy discussion at the meeting regarding what is the best grass selection for the Saddlebrook Ranch putting greens. At this elevation, a strong argument can be made for creeping bentgrass. When the time comes to consider building the new golf holes, it would be wise to seed the new greens to creeping bentgrass.

- Once there are an additional 18 holes of golf open for play, then you may consider switching from bermudagrass to bentgrass on the existing course. However, it is important to note that such a project would require course closure of approximately four months, and would require the removal of 4 to 5 inches of the current rootzone to effectively remove all of the existing bermudagrass material. This is absolutely essential to avoid bermudagrass contamination upon seeding the greens to creeping bentgrass.

- The cost of such a project often ranges from \$300,000 to \$500,000.
- Given the costs and disruption to golf, it is recommended to focus on the Tifdwarf and overseeded grass scheme that is currently employed. Improvements can be expected with a more rigorous aeration and sand topdressing program for organic matter reduction at the surface. This will provide an improvement in ball roll and green firmness. When the time comes to consider renovation to bentgrass, we can discuss this project in greater detail.

Summary

Thank you for the opportunity to visit with Mr. Blake and meet with course officials and members to discuss the short-term and long-term recommendations to improve year-round playing conditions at the Saddlebrooke Ranch Golf Club. As discussed, the primary focus should be placed on improving soil conditions and establishing a strong bermudagrass base in fairways. Once established, the membership will have greater flexibility with regard to a decision on overseeding or not overseeding fairways. I look forward to continuing to work with the club and helping you move forward with the ultimate goal of improving year-round playing conditions for both members and public play.

Thank you for supporting the USGA Green Section. Please do not hesitate to contact my office should you have any further questions or concerns.

Respectfully submitted,



Brian Whitlark, Agronomist
USGA Green Section

Distribution:

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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.

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.



For questions regarding this report or any other aspect of the USGA Course Consulting Service, please do not hesitate to contact our office.

