COURSE CONSULTING SERVICE

Onsite Visit Report

Cranberry Valley Golf Course
Harwich, Massachusetts

Visit Date: August 21, 2020

Present:
Mr. Shawn Fernandez, Golf Course Superintendent
Mr. Rob Donovan, Assistant Superintendent
Mr. Roman Greer, Director of Golf
Mr. Clem Smith, Chairman, Harwich Golf Committee
Ms. Martha Duffy, Vice Chair, Harwich Golf Committee
Mr. Steve Bilotta, Committee Member
Mr. Jack Connolly, Committee Member
Mr. John Crook, Committee Member
Mr. John Wheeler, Committee Member
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The USGA Green Section develops and disseminates sustainable management practices that produce better playing conditions for better golf.

Executive Summary

It was great to make a half-day course consulting service visit to Cranberry Valley Golf Course on August 21, 2020. The purpose of this visit was to assess conditions and discuss best management practices for daily and long-term maintenance.

This was my first time visiting Cranberry Valley so we spent a considerable amount of time discussing the history of the golf course and historical maintenance practices. This summer has been exceptionally hot and dry which has been challenging for many courses in the Northeast. Cranberry Valley has held up well despite some minor turf thinning that occurred in the fairways. All of the areas where turf had declined were due to poor distribution uniformity from the sprinkler system. Thankfully, the irrigation heads and wires are going to be replaced in the near future. We also examined soil profiles from all of the fine turf areas and discussed management practices for each playing surface. The putting greens were in great condition and should provide good playability heading into the fall season.

The topics discussed during our tour of the golf course are outlined in the table below and discussed in greater detail throughout the remainder of this report.

Table of Contents:

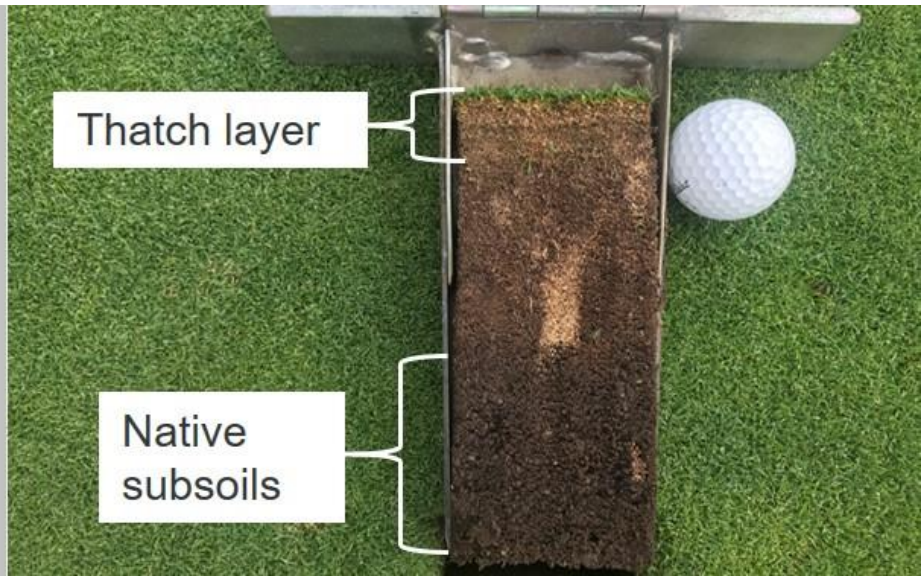
Putting Greens

Observations

1. **Organic matter (thatch) content in the upper portion of the profile is greater than desired.** Excessive organic matter content creates soft playing conditions and predisposes the turf to mechanical damage, disease, ball marks and a host of other agronomic concerns. This layer acts like a sponge near the surface and negatively impacts drainage and root development.

    - Diluting thatch content in the putting greens is the greatest opportunity for improvement on the golf course at this time.

The thatch layer near the surface retains moisture and increases the risk for turf failure. Core aeration in spring and fall should continue and implementing a topdressing program will dilute new thatch as it is produced near the surface.



2. **The putting greens have a topdressing layer approximately 4 inches deep.** Below that layer are the finer textured soils used for original construction of the putting greens. The topdressing layer will drain well and resist compaction, but the underlying subsoils do not have the same desirable characteristics.
3. **Some of the putting greens were expanded by gradually reducing the height of cut in the collars.**

    - The expansion areas are a great idea to restore the putting greens back to their original shapes and sizes.

    - The expansion areas do not have the same 4-inch topdressing layer that the rest of the putting greens do. As a result, the turf in the expansion areas examined was not as healthy as the rest of the putting greens. As expansion areas are core aerated and sand topdressed over time, they should continue to improve.

4. **The putting greens are currently being core aerated every April and October.**
5. **Light and frequent sand topdressing applications were scheduled to begin this summer, but did not happen due to the COVID-19 pandemic and associated logistical challenges.**
6. **The plant growth regulator Legacy® is being applied to the putting greens every month.**

- Plant growth regulators are used primarily to suppress top growth to provide more consistent conditions throughout the day and to reduce clipping yield. Secondary benefits include improved drought tolerance, shade tolerance, root development and when Class B regulators are used – *Poa annua* control.
- Plants metabolize growth regulators faster during periods of warm weather. Once the regulator is metabolized, plants will grow faster than they would if not regulated at all. This is known as the "rebound phase". It is critical to maintain suppression during periods of hot and humid weather. Optimal application intervals are best measured by tracking growing degree days (GDD). Zero degrees Celsius is used as the base temperature for this model.
    - Turf mowed at higher heights of cut remains in regulation longer than lower height turf. If growth regulators are applied to turf mowed at collar or fairway height of cut on putting green intervals, overregulation can occur. The ideal reapplication intervals for different products and heights of cut are outlined in the table below.
    - The GreenKeeper app is a free tool that many superintendents find useful to help automatically track growing degree days.
- Rates impact amount of suppression, not duration.
- GDD, HOC and active ingredient impact duration.
- Applying too frequently can produce "overregulation", especially on higher HOC and *Poa annua* turf.
- Not applying frequently enough results in the turf growing faster than if it was not regulated at all. This can lead to scalping, mechanical injury, increased disease pressure and soft, puffy playing conditions.

Active Ingredient	Common Name	PG ideal GDD	FWY ideal GDD
Trinexapac-ethyl	Primo Maxx	200	350-380
Paclobutrazol	Trimmit	280-310	480-640
Flurprimidol	Cutless	210-270	380-410
Prohexadione-Ca	Anuew	280	350-380
Flurprimidol+ Trinexapac-ethyl	Legacy	270-300	320-390
Flurprimidol+ Trinexapac-ethyl+ Paclobutrazol	Musketeer	290	350-400

Applying PGRs based on growing degree days will provide consistent suppression and avoid the "rebound phase", where turf will grow faster than if it was not regulated at all. Note the difference between fairway height and green height as well.

Recommendations

1. **Reducing thatch content in the putting greens is the greatest opportunity for improvement on the golf course at this time.** Recommendations for reducing thatch content are outlined below.

    - Continue to core aerate the putting greens with 0.625-inch hollow tines every April and October. Remove all of the cores and backfill all of the channels with 100% pure sand topdressing.

    - Sand topdressing should be applied to the putting greens every 14 days at a rate of 75 – 100 pounds of sand per 1,000 square feet. Sand topdressing helps smooth the surface and dilute new organic matter as it is accumulating near the surface.

    - Use small diameter hollow tines once per month to vent the putting greens throughout the season. Many facilities have seen great results with the use of Ninja® tines or Samurai Tines™. These tines provide longer-lasting venting effects than solid tines and also remove trace amounts of organic matter throughout the season.

        - Cleaning up the cores can be easily accomplished with blowers and shovels. The cores are very small and easy to remove.

2. **Continue expanding putting greens in areas where they have shrunk in size over time.**

    - Expansion areas and areas that are going to be expanded should be core aerated, topdressed and treated like the rest of the putting greens. As a topdressing layer increases in depth these areas will become healthier and more reliable.

3. **Continue using the plant growth regulator Legacy, but apply it according to growing degree day models.** This product should be applied every 300 growing degree days. This will keep the turf regulated consistently but will also avoid entering the “rebound phase”, which is where the turf grows faster than if it was not regulated at all.

    - GDD do not always correlate with calendar weeks, but if the application had to be scheduled I would anticipate reapplying Legacy every two weeks during summer and every three to four weeks during periods of cooler weather in spring and fall.

Teeing Grounds

Observations

1. **The teeing grounds were in good condition considering the resources available for daily maintenance.**

    - Minor dollar spot disease was observed on some of the teeing grounds, but that should be expected with only four or five fungicide applications being made every year.

2. **Thatch content in the tees was slightly elevated.** Reducing thatch content will provide firmer tees and reduce susceptibility to turf diseases, such as dollar spot.

3. **We discussed the idea of moving the middle tee on Hole 13 towards the cart path to shift it away from the 10th hole.**

Recommendations

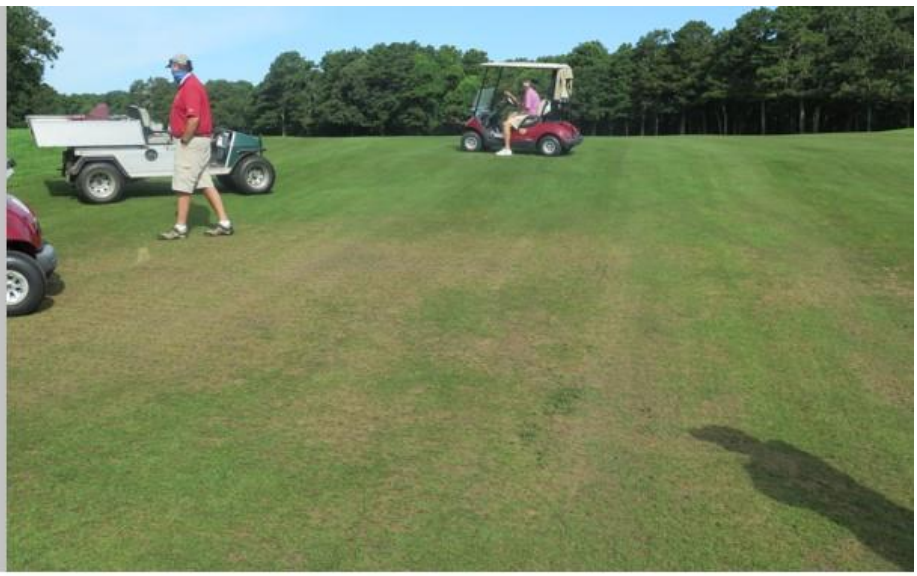
1. **Continue to perform hollow core aeration on the tees every fall.** One aeration event per year will not be enough to reduce thatch content so aggressive verticutting (dethatching) should be performed in the spring to help gradually reduce thatch content.
2. **I encourage you to discuss moving the tee on Hole 13 with your golf course architect.** From an agronomic standpoint, this would be a rather simple task to complete and would include relocating irrigation, removing the trees on the right side of this golf hole, bringing in a sand-based rootzone mix to construct the tee and sodding tee.

Fairways

Observations

1. **Most of the fairways were core aerated within the last couple of weeks.** The fairways were recovering well and some perennial ryegrass germination was observed on the fairways that were aerated last week.
    - The fairways are typically core aerated every spring and fall and overseeded with perennial ryegrass following the fall aeration.
    - Areas with poor turf density will be slice seeded later in September and early October if they did not recover from the aeration and overseeding in August.
2. **The fairways are predominantly perennial ryegrass, but some creeping bentgrass and *Poa annua* was also observed.** Perennial ryegrass remains the best option for the fairways considering the heavy play volume and maintenance budget.
3. **Small areas of turf decline were observed on several of the fairways.** These areas appeared to be strongly correlated to irrigation patterns. That is, areas were the irrigation system does not have proper coverage had declined. This is not surprising considering the exceptionally hot and dry summer experienced this year.

The pattern of turf thinning in the fairways was strongly correlated to the layout of the irrigation system. This is a sign that irrigation heads have worn out and are not applying water uniformly. New irrigation heads will help resolve this issue.



- Small signs of turf decline from dry conditions are a sign that the rest of the fairway is being irrigated with proper amounts of water. If no dry spots are observed during a period of extended drought that means other parts of the fairway are being over-irrigated to compensate for the inefficiencies in the irrigation system.

- Even brand new state-of-the-art irrigation systems cannot apply water 100% uniformly. The lack of uniform coverage is what creates dry spots during prolonged periods of dry conditions. Thankfully, the irrigation heads and wire system will be replaced in the near future. This will improve the distribution uniformity of the irrigation system and reduce the number of dry spots that develop during prolonged periods of dry conditions.

4. **The plant protectant program on the fairways is what I would consider a minimalistic preventative program.** There are approximately four or five fungicide applications budgeted every year for the fairways. This type of program will reduce the likelihood for widespread turf decline from disease but will not prevent all disease.

Recommendations

1. **The fairways were in good condition and considering the resources available for daily maintenance, I do not have any further recommendations.** The slice seeder that was acquired will be a great addition to continue increasing perennial ryegrass populations over time. Replacing the irrigation heads throughout the golf course should also improve the conditioning of the fairways by reducing the number of dry spots that developed during prolonged periods of dry weather.

    - Any further improvements to the fairways would require an increase in budget to provide for additional fungicide and plant protectant applications. However, I do not feel this is necessary at this time considering expectations and typical environmental conditions.

Bunkers

Observations

1. **The bunkers are being renovated as part of a multi-year strategy.** This year, approximately 15 bunkers are going to be renovated.

    - The last time the bunkers were renovated a fabric liner was installed. Fabric liners can help reduce the likelihood for sand washouts but are not necessary at Cranberry Valley because the bunkers do not have steep sand faces. Furthermore, fabric liners are highly likely to be snagged by mechanical rakes and then brought to the surface. When fabric liners begin to surface, they are no longer functional and create playability issues.

    - The bunker faces on most of the older bunkers are beginning to deteriorate. This is largely due to sand splash that has accumulated on the faces of the bunkers.

    - The sand in the bunkers has been contaminated over time due to sand washouts.

Recommendations

1. **I fully support continuing the bunker renovation program.** Renovating the bunkers will include the following:

    - Removing and replacing all of the bunker sand.

- Fabric liners will be removed and no liner will be reinstalled. Due to the flat bottom style design of the bunkers, I do not feel a liner is necessary. This will save money on the renovation cost and reduce the likelihood for snagging fabric liners in the future.
- Drainage in most of the bunkers is still functional but should be replaced in areas where it is compromised.
- The bunker surrounds should be resodded with turf-type tall fescue. Turf-type tall fescue is more drought tolerant and less susceptible to diseases and insect pests than Kentucky bluegrass and other species commonly used in primary rough.

Trees

Observations

1. **A significant amount of tree work has been performed over the past several years.** This work has targeted the poor growing environments around putting greens, tees and fairways.
2. **The golf course is heavily wooded and will benefit greatly from continued selective tree removal.**
    - The environment that turf occupies is the most influential factor on turf health and reliability – bar none. Continually improving growing environments around fine turf areas is critical to improve turf health and reliability and reduce the risk for disease development.

Recommendations

1. **Continue allocating funds every year for selective tree removal throughout the golf course.**
    - When examining trees on the golf course and identifying trees for removal, the following questions should be asked:
        - Does the tree cause shade, limited air movement, root competition or traffic problems?
        - Does the tree narrow playing corridors, have surface roots or create a double hazard?
        - Would a great view be exposed if a tree or trees are removed?
        - Are high handicap players more penalized by the tree?
        - Is the tree healthy?
    - After evaluating trees on the golf course based on the above questions, selective removal should be prioritized based on the following characteristics:
        - Declining and unhealthy trees should be removed first.
        - Trees negatively impacting growing environments around fine turf areas such as putting greens, tees and fairways should be removed.
        - Species that are poorly suited for golf courses and areas of general overplanting should be addressed once the above trees are removed.

Equipment

Observations

1. **The golf course is extremely busy with over 48,000 rounds of golf being played annually.** Having a busy golf schedule elevates the importance of having efficient and reliable maintenance equipment. Most of the maintenance on the golf course needs to be performed before golfers arrive and if breakdowns occur, tasks are not completed.

    - Having modern and reliable equipment also increases operational efficiency and decreases the likelihood for turf decline or catastrophic turf loss due to equipment failure.

Recommendations

1. **I was glad to hear that the irrigation heads and wiring system are going to be replaced in the near future.** Replacing the irrigation heads will improve irrigation accuracy and reduce the number of wet and dry spots that develop on the golf course.
2. **Considering the amount of tree removal that has been and is going to be performed on the golf course, it would be wise to purchase a stump grinder.** Cutting trees down is only the first step in removing trees on golf courses. The site must be remediated after the tree is removed and a stump grinder is the most efficient way to get this done.

    - It sounded like there may be an opportunity to purchase a stump grinder and share it between multiple departments within the town. This could work as long as the golf course is able to use stump grinder during late fall and winter months when they would have the labor hours available to use the equipment.
3. **A spinning topdresser should be acquired as soon as possible.** As discussed earlier, reducing thatch content in the putting greens is the greatest opportunity for improvement on the golf course at this time. One of the programs that will accomplish this is regular sand topdressing applications. Sand topdressing needs to be performed before golfers get on the golf course so it is imperative that this equipment is reliable and efficient.

    - Many facilities have seen good results with the Turfco® Widespin 1550 topdressing unit because it is reliable and gives the operator the ability to enter the topdressing rate into the computerized system.
4. **A deep tine aeration machine would be largely beneficial for improving turf health and reliability on the putting greens, fairways and high-traffic areas in the rough.** The native soils on the fairways are severely compacted and traditional aeration equipment does not penetrate deep enough to correct this issue.

    - Deep tine aeration can be performed on fairways and high-traffic areas throughout the season with large diameter solid tines. This is a very slow process but is well worth the time.

    - Deep tine aeration is often performed on soil-based putting greens in the late fall on golf courses in the Northeast. Solid tines are used to create channels 10 – 12 inches deep into the putting green profile and to alleviate compaction in the underlying native subsoils. This significantly improves internal drainage and root development the following season.
5. **The next time sprayers need to be purchased, I encourage you to acquire a sprayer equipped with GPS technology and individual nozzle control.** These sprayers use GPS technology to track where the sprayer has traveled to reduce the likelihood for overlap or skips

during an application. The individual nozzle control provides greater accuracy and reduces total product usage. Most facilities using this technology have seen a reduction in total product usage of approximately 10 – 15%.

- The USGA article Tremendous Savings from GPS Spray Technology explains the benefits of this technology in greater detail.

Course Accessories

Recommendations

1. **Remove the golf course accessories from the golf course.** This includes items such as ball washers, benches and trash cans. Removing or significantly reducing golf course accessories can provide additional resources to be reallocated to higher priority areas, such as putting greens.

   - More often than not, these items are on a golf course because golfers have come to expect them, not necessarily because they are heavily used. For example, ball washers are typically located on the teeing grounds. Many would question why a golfer needs to clean a ball after putting out just minutes prior. Regardless, these pieces of equipment require constant maintenance throughout the season – removal can provide a cleaner appearance, save money and streamline daily maintenance.

   - Accessories can be left on par-3 holes if a handful of ball washers or benches are to be left on the golf course. This significantly reduces the overall cost, but still provides golfers with the accessories they may need occasionally.

   - The following case study shows how some golf courses have benefitted from removing golf course accessories from their facilities.

Summary

I was impressed by how healthy turf was on the golf course considering the stressful summer weather and the heavy play volume the golf course receives. At this time there are no major concerns that need to be addressed, but reducing thatch content in the putting greens will certainly improve turf health, reliability and playability. Reducing thatch content and improving growing environments around putting greens will significantly reduce disease pressure on these fine turf areas. I was also pleased to hear that the irrigation heads and bunkers are going to be upgraded in the near future. The irrigation system is the lifeblood of the golf course but oftentimes is not viewed as a priority by key stakeholders. I commend those involved with approving the irrigation system upgrades.

I truly enjoyed touring the golf course and look forward to working with you in the future. If you have any questions or anything in this report, or if I can be of further assistance at any time, please do not hesitate to contact me.

Additional Considerations

The USGA appreciates your support of the Course Consulting Service. Please visit the *Green Section Record* to access regional updates that detail agronomist observations across the region. Also, please

visit the Water Resource Center to learn about golf's use of water and how your facility can help conserve and protect our most important natural resource.

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Respectfully submitted,

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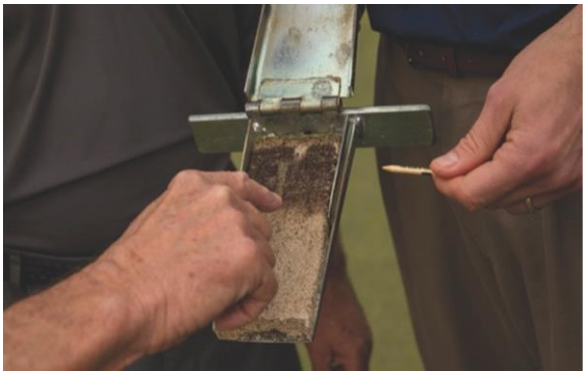
USGA Green Section, Northeast Region

Distribution:
Mr. Shawn Fernandez, Golf Course Superintendent

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.