Course Consulting Service

ON-SITE VISIT REPORT

GLENS FALLS COUNTRY CLUB
Queensbury, New York

Visit Date: August 29, 2016

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

It was my pleasure to make a half day Course Consulting Service visit to Glens Falls Country Club on August 29, 2016. The following report is offered as a summary of the major points discussed during the visit.

It has been a challenging summer season beginning with drought conditions followed by more intense heat and higher humidity. The golf course performed well through the dry spring and early summer seasons. The staff has been hard at work keeping up with the daily irrigation requirements. The season became even more challenging at the end of July when hotter temperatures and humidity began to impact the turf and the way in which the golf course could be irrigated. Higher temperatures and increased humidity also brought with it more disease pressure and a higher stress level to the plants. At that time, more recently sodded collar and apron areas, and green expansion areas began to decline. This has been a common occurrence this season across the region.

We used our time together to review some of the turf areas that have struggled. We also examined root development in the greens and other areas of the golf course. We discussed practices to try to alleviate a hardpan or compacted soil zone that was prevalent in the greens. We discussed additional tree removal work to further improve growing environments on putting greens, to improve playing surfaces and to restore vistas across the property. Other topics discussed during our visit included weed management programs, fairway contouring, sand bunker banks, tall grass roughs and other subjects that will be covered in this report.

GREENS

Soil Management

We examined the profiles in a number of greens and a soil hardpan layer was prevalent. That layer can be found at about a 4 - 5 inch depth. The compacted soil layer impacts water infiltration or internal drainage through the root zone. The compacted layer also prevents roots from extending more deeply into the profile.

The conventional core aeration programs are strong and no changes are recommended there. However, those programs target the upper 3 inches of the root zone and are used to manage organic matter and modify those soils with sand. A deeper form of aeration is required to reduce the impacts of the soil hardpan. Deeper forms of aeriation include:

- Deep spiking with the Soil Reliever machine (1/4 solid tines)
- DryJect® sand injection
- Floyd-McKay drill and fill
- Air2G2 air/water injection
- Toro® HydroJect®

With the machines that are available, the Soil Reliever machine probably offers the best opportunity for deeper spiking of the greens. That practice would be done with the 1/4

inch solid tines down to a 5 – 6 inch depth or to penetrate the hardpan zone. The practice would be scheduled for April, May and even early June.

The DryJect® machine injects sand down to a 4 – 5 inch depth. This practice would be done on a contract basis. It is a labor intensive operation that will require the use of dry sand. The Floyd-McKay drill and fill would auger the greens on a 6 inch spacing using 3/4 inch hollow tines. The holes would be backfilled with dry sand creating a vertical column that would extend through the hardpan zone. This practice is normally done later in fall after most of the play is finished. This practice would be well suited for all of the greens and especially No. 3 green which continues to struggle. That green could be double drilled and filled to increase the hole frequency. It might be possible to have the process contracted on No. 3 green and any other more problematic or slower draining greens were the hardpan is having a greater effect. Although this practice is completed in the fall, the auger holes will remain visible well into spring.

Continue to core aerate the greens with hollow tines in the spring and late summer seasons. That practice will continue to modify the upper root zone with better draining sand. It will also manage organic matter. The light topdressing program is also an important part of the soil management practices. The sand applications should be made on a two or three week schedule through the entire season if possible. This will build a sand layer above the native soils, which will also support a deeper root system.

Consideration should be given to purchasing a Toro 648 ProCore® machine to replace the older John Deere machines. The ProCore® machine provides more versatility for cultivation practices. It can complete the aeration very quickly and is well suited for deeper spiking practices and regular venting (1/4 inch needle tines) during the summer season. The venting practice (not disruptive) alone would improve the ability for the greens and especially green expansion areas and aprons to tolerate warmer temperatures and difficult summer conditions.

Growing Environments

A number of greens continue to be impacted from compromised growing conditions. Number 3 green has long been impacted by limited air movement. The greens location in a hollow is such where natural airflow will always be compromised. I continue to recommend removing the euonymus bushes that are planted on the right back corner of the green in hopes that it will improve natural air circulation. The work that has been done to the right of the green has been beneficial and hopefully that wooded area can continue to be thinned to maximize airflow there. Eventually, a fan may be required to provide air circulation over this challenging green. That decision would be based on the performance of the turf going forward.

The 1st green continues to be impacted by a large cedar hedge that runs along the left side of the green. The cedar hedge is shading the apron, collar and left side of the green especially in the fall and winter seasons. This will cause that side of the green to weaken. A Norway spruce tree planted to screen a utility pole also shades the left half

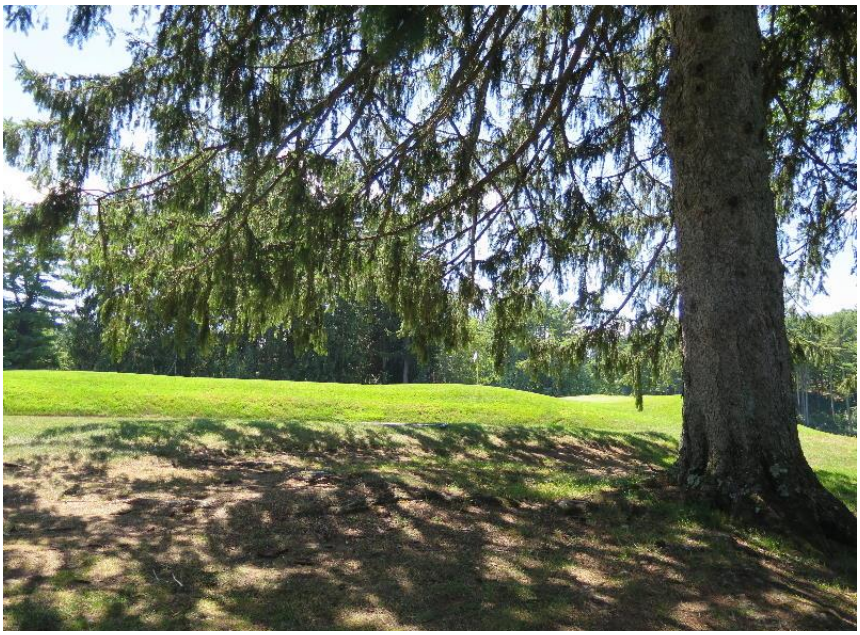
of the green in the fall and winter seasons. The tree is in poor condition so ideally it should be removed or at least topped so that the sun can reach the green in the afternoon hours. I also recommend removing a large oak tree that is growing on the right side of the green (inside the cart path) and to cut back and thin trees that are growing behind the green in hopes of improving air circulation there.

The 2nd green is also impacted by trees growing on the left and back side. These trees block sun to the green in the morning hours during the fall and spring months. This weakens the turf and leads to longer frost delays. The tree stand should be thinned of all white pine trees and lesser quality deciduous trees. This will open up more avenues for light to reach the green and should also improve air circulation over the green complex.

The tree stand that separates the 4th and 13th green should be thinned even more so. The remaining white pine trees in the stand should be eliminated and most of the poor quality deciduous trees removed. This should leave three or four better quality deciduous trees that will have less impact on the growing environments of both greens. The work will also improve the appearance of the area.

The 17th green remains shaded especially in the fall and winter season. Trees that are growing along the left side of the green and approach should be removed so that morning sun will reach the green during the crucial time of the growing season. The fall sun is extremely important for the turf as it begins to acclimate itself to the winter season. That tree work should be extended down both left and right sides of the fairway.

We also looked at a Norway spruce tree growing on the right side of the 14th green. The picture illustrates the impact of the tree on play from just off the green. Surface roots from the spruce tree are also creating an unplayable and almost unmaintainable surface just off the green. A similar situation exists on the right side of the 16th green where two white pine trees impact the surface there. Surface roots create a dangerous play situation and impact maintenance. The roots are also competing aggressively with the turf for moisture. The trees are located too close to the green and should be removed.



Large spruce trees growing adjacent to the 14th green have surface roots that make the surface almost unplayable and recovery shots impossible. Remove the large spruce tree pictured above and pull the roots and regrade the surface.

Expansion Areas

A number of the expansion areas of the greens, collars and aprons have declined. This is common in the first year of establishment even in a relatively mild season. The more stressful summer weather we have experienced has made establishing these areas even more challenging. The return to more seasonal temperatures on the week of this visit will certainly improve growing conditions for the turf and hopefully those weather conditions will persist so that core aeration and overseeding work can be initiated. Those practices will begin the recovery process for the damaged and/or thinned areas.

A recently established apron in a high traffic area behind the 4th green shows signs of wear injury from the concentrated traffic, the impacts of the sod/transition layer, and the high temperatures in the first year of establishment. The wear tolerance of the grass will improve once the turf is established.

A combination of factors impacts turf in these areas. The fact that the turf is still relatively young having been established from nursery sod leaves the plants weaker. Usually there is a layer condition or soil interface between the sod and the soils on site that has to be overcome through regular cultivation. Many of the areas that have struggled are also in more high-traffic zones where there is equipment operation and/or foot traffic. The wear injury combined with the weather stress and weaker root system results in the turf decline. The following recommendations were provided:

- The primary objective this fall is to recover damaged areas. The areas will be overseeded and topdressed with the aeration in early September. I also recommend spike seeding any of the thin areas much in the same way as you would with a winter kill situation through late summer and fall. Collar and apron areas that are not recovered by mid-October will have to be plugged out or replaced with nursery sod.
- The soils beneath some of the apron and approach areas were extremely compacted. The late summer aeration program should be helpful for alleviating the compaction. However, utilize your Soil Reliever machine for deeper spiking later in the fall and even next spring to try to alleviate the compacted soil conditions. Use the Toro HydroJect for that purpose if it is still working.
- Carefully monitor workers to prevent them from turning equipment in the still establishing apron areas. Utilize turning boards at least on selective greens where there is less room to operate equipment (i.e. No. 4 green, the back of No. 3 green, etc.). Plastic lattice works as well as any material and is light. Utilize the turning boards this fall and at the start of next season to prevent the wear injury from occurring.
- Hand mow the apron and immediate approach areas. Try to extend the hand mowing further away from the greens to eliminate the need to operate triplex equipment there.
- The collar and apron areas should be maintained at a fairly low mowing height to keep the surfaces tight. This may require lowering bench settings to .325 or even lower to help reduce the grain or horizontal growth and to produce a true .4 – .5 inch cut in the field. The lower heights of cut should increase plant tillering and improve turf density. The lower height of cut will also leave the plants less vulnerable to abrasion injury from traffic and topdressing.
- Try to vent the collar and apron areas on a monthly schedule through the season.
- Topdress all of the collar, apron and approach areas at the same frequency as the greens. The topdressing though abrasive will in the long term help to protect the plants. The topdressing can be suspended during extreme heat of summer.
- The apron and collar areas might also benefit from some additional supplemental fertility to help offset the effects of the traffic and help the plants recover. A natural organic fertilizer can be used through a drop spreader to provide 1/4 pound of nitrogen per 1,000 square feet in early-mid June. A second application might be considered for mid-July if you feel it is necessary.

The article Problem Collars and How to Fix Them will also provide some helpful tips for managing and establishing the turf in these areas.

TEES

Trees

The 5th tee is located in a heavily shaded environment. Remove two maple trees that are growing on the right side of the tee box to increase morning sun exposure for the turf. Some additional tree work may be required along the right side of the tee to ultimately improve its condition. The right half of the 2nd tee box cannot be fully utilized. The tree work that was completed along the right side of the hole has improved that condition but more work should be done to cut back the tree line further. That work will allow for more shot options off the tee and should also lead to wider use of the tee.

FAIRWAYS

Contour Changes

A renovation program was underway to reestablish fairway contours on the 13th and 15th fairways. Some of the work was done last season and has been successful. Growing in fairway perimeters from seed is a challenge. The seeding and renovation program that has been developed appears sound and no changes are recommended there. The young seeded turf will be more susceptible to wear injury from mowing and cart traffic. Continue to use a triplex machine to mow the fairway perimeters where the contours have been altered. The triplex machines would ideally be equipped with solid rollers to further reduce wear injury during the first and second years of establishment. This is especially important in more severe contours where turns are tighter. I also recommend using the John Deere machine to cultivate all of these areas next spring to further alleviate compaction before the summer season. Use a 1/2 inch hollow tine and try to topdress those areas if possible following the practice. The aeration would be scheduled for early-mid May.

Weed Management

The warm temperatures this season have been ideal for crabgrass, which was active in many fairways at the time of this visit. Expand your preemergent herbicide program to cover more fairway areas. A split application of Dimension® should be effective with your sandy soils. Crabgrass plants can be treated with Drive® if the material is available. The applications would be made before the crabgrass has an opportunity to drop seed. Otherwise, be prepared to treat most of the fairway acreage with the preemergent herbicide next spring.

Water Management

The sandy fairway soils have low water retention. The water requirement is higher as a result. Ideally, the fairways should be maintained as dry as possible with even some moderate signs of drought stress being apparent. However, to do so is difficult as the turf can quickly show symptoms of drought stress and damage from cart traffic becomes apparent. Once the sandy soils dry they can also become water repellent or hydrophobic. A wetting agent is being applied to the fairways through the irrigation system. This is probably going to manage the water repellent soils as well as any product. However, I would experiment with several different wetting agent chemistries to see if there are any chemistries that are more appropriate for your sandy soils. I recently observed good results with the product Hydro-90 (Harrell's) when used on an experimental basis at Fishers Island Club. The wetting agent was used on irrigated and non-irrigated fairways and both responded very well from even a single spring application. I only suggest that you obtain several different wetting agent chemistries to apply over selected fairway areas to see if they will improve the summer management programs.

ADDITIONAL COMMENTS

Sand Bunkers

Grass faced bunker banks continue to be a challenge to manage. The southern exposed bunker faces suffer from drought and heat stress in the summer season. Upgrading the irrigation coverage on the banks would be helpful. I also recommend regrassing the bunker faces with fescue turf taken from a non-irrigated rough area. The turf in the non-irrigated roughs has adapted to those sites and is probably better suited for the more difficult bunker banks. The other option is to regrass those bunker banks with a commercial turf-type tall fescue sod. I have observed the turf-type tall fescue holding up quite well on southern exposed bunker banks. I will provide a list of New England sod suppliers that should have turf-type tall fescue available.

Tall Grass Roughs

It is interesting to see that many of the native areas or tall grass roughs are being dominated by little bluestem grass. Little bluestem is a warm season native grass that is probably at the northern extent of its range. The little bluestem will have a very deep root system that will not be impacted by drought conditions. Little bluestem does not start its growth until early summer. Therefore, areas that are predominately little bluestem can be cut up until the end of May or even early June at which point the little bluestem grass will begin its growth. Cutting the areas through the spring season will help to reduce some of the weed pressure and will also keep the areas more playable when growth can be thick in spring. The extended period of mowing will eliminate any seedhead production on the fine fescue in those areas and eventually will allow the little bluestem grass to outcompete the fescue. Areas that you wish to maintain fescue

should not be cut beyond late April or early May as this could inhibit seedhead production for the entire season.

Eliminate all irrigation coverage in any tall grass rough areas. The irrigation will lead to more weed encroachment and to overly dense growth.

We examined the naturalized rough area on the left side of the 16th hole. I recommend cutting the area at this point as it is dense and does have some weed growth. The area can then be treated with a combination of 2,4-D and dicamba (Crossbow®). Garlon® and BrushMaster® are also very effective broadleaf herbicides that will remove any of the woody plants that try to establish in that area. Map all of the tallgrass roughs where crabgrass or foxtail is not present. Those can be treated with pendimethalin or Barricade® to prevent the annual grasses from establishing.

It is my hope that the tall grass rough areas will be extended to other parts of the golf course. In my opinion, they are an integral part of the golf courses design and in many locations could replace some of the tree plantings. The tall grass roughs can provide a formidable but playable hazard and offer much more risk/reward shot opportunities as compared to tree plantings.

Little bluestem at Ekwanok Golf Club is used to frame holes and provide a natural setting for the golf course. Glens Falls CC and Ekwanok GC share similar sites.

Trees

Recommendations were made earlier in this report to remove trees that were impacting growing conditions for the turf or that were interfering with play. Recommendations have been made in the past to selectively remove trees to expand vistas from the 13th, 14th,

15th and other holes on the golf course to maximize the vistas, which are a unique and beautiful feature of the golf course.

We discussed removing white pine trees that are growing between the 13th green and 14th tee to begin to expand a vista. Additional selective tree work can be completed in the future to further expose that view.

We also discussed last season the benefits that could be obtained from thinning white pine trees in the wooded area along the 2nd hole. Similar work would be beneficial in other areas of the golf course to begin to highlight some of the better quality trees and to remove unnecessary trees. The health of the trees that will remain on site will improve and those specimen plantings will be more noticeable. There are a good number of poor quality white pine trees and spruce trees that are good candidates for removal.

CONCLUSION

This concludes my summary of the topics discussed during my visit to Glens Falls Country Club and I hope this report proves useful. Best of luck for a successful season and please feel free to call at any time throughout the year if I can be of additional assistance.

The USGA appreciates your support of the Course Consulting Service. Please visit the Course Care section of usga.org 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.

Sincerely,

James E. Skorulski, Agronomist
Green Section, Northeast Region

JES:sjd

cc: Mr. Chris Frielinghaus, CGCS

Reprints:

Understanding the Different Wetting Agent Chemistries
http://gsr.lib.msu.edu/article/zontek-understanding-7-20-12.pdf