



RCGA GREEN SECTION SECTION DES VERTS DE L' ARGC



1996 AGRONOMY VISIT

GARRISON GOLF & CURLING CLUB

KINGSTON,.ONTARIO

October 3, 1996

Ted Yamada, P.Ag.
National Director, RCGA Green Section

**ROYAL CANADIAN GOLF ASSOCIATION
GREEN SECTION CLUB VISITATION
PROGRAM**

DATE: Oct.3, 1996

CLUB NAME: GARRISON GOLF & CURLING CLUB

ADDRESS: Canadian Forces Base Kingston
Kingston, Ontario
K7K -5LO

SUPERINTENDENT: David Erb

CLUB OFFICIALS: Mike Vallancourt - Chairman
Jean Macken - Vice President

NUMBER OF HOLES: 18

DOMINANT GRASS TYPES:.

GREENS: Penncross creeping bentgrass, *Poa annua*

TEES: Kentucky blue grass , perennial ryegrass, *Poa annua*

FAIRWAYS: Perennial ryegrass, Kentucky blue grass , *Poa annua*, native bentgrasses

The Garrison Golf & Curling Club is a mature golf course located on a clay and shale base. The various golf holes are between 10 and 20 years old. This is an age at which certain characteristics of a golf course routinely start to show. The soil has had several winters to heave and settle and the trees have had a chance to mature. We are now able to see the settled terrain and the natural drainage patterns. We are also able to determine which trees have become a problem due to location or inappropriate species selection..

Fairways are currently the main concern at Garrison due to unplayable conditions in the spring. Any problems with the fairways can be summed up in two words, water and soil. There is a severe lack of soil on the fairways which makes the installation of an effective sub-grade drainage system very difficult. Water movement off and through the soil is a major concern on both the fairways and the greens.

GREENS

The original material used to construct the greens varies in texture between the older and newer greens. The older greens were constructed from a coarser grade of sand. Several years of topdressing has developed a layer on top of both types of greens approximately 2.5 inches thick. This topdressing layer has become the effective rootzone. Water does not pass easily from a layer of one particle size through to another layer of a different particle size. The interface between the top dressing layer and the original greens mix has become a perched water table. Water stays in the topdressing layer and follows the contour of the green flowing into the depressions of the green rather than moving downward into the next soil layer. This causes isolated dry spots on the high points of the green and excess water in the depressions.

Roots can be seen extending down into the original construction material where there is an aerating hole. This shows quite clearly the need to continue the aerating and topdressing process to continue to build up the topdressing layer and deepen the rootzone. The older greens unfortunately have an additional layer of a heavier soil between the original coarse sand and the current topdressing mix of 80% sand / 20% peat. This soil layer will always impede water movement and should be removed. Continued aerating will eventually reduce this layer, however, once the topdressing layer reaches a depth equal to the length of the aerator tines, removal of the offending soil layer is no longer possible. A deep tine aerator such as a Verti-drain that can penetrate up to 18 inches will be required.

The use of water injection aerators have become very popular recently especially during the summer months. These machines are very good for temporary compaction relief during the growing season but they were not designed to replace regular aerating. Core aerating is still required especially if the club wishes to amend the composition of the greens. Also, caution must be taken with older soil greens with a topdressing layer being built on top. The pressurized water can wash some of the soil particulates up into the topdressing layer and cause contamination.

FAIRWAYS

Drainage and irrigation

The antiquated irrigation control system is in part responsible for some of the uneven water flow on the property. However, the overall drainage off the golf course must first be improved before an upgrade to the irrigation system would be effective. A long-range plan for capital improvements to the golf course would help to ensure progress stays constant in the future, even as committees and directors change.

Currently, surface drainage is relied upon to move water off the playing surfaces. Subgrade drain tiles have not been entirely effective since the depth of soil over the bedrock is very shallow in many areas. The few tiles that have been installed heaved during the winter and have become distorted, blocking flow. A good example of this can be seen on Fairway #18. To properly install sub-grade drain tiles, two options are available to the club:

- i) backhoe and possible blasting of the rock to an adequate depth, or
- ii) additional topsoil must be added to create a deeper rootzone and provide room for tiles.

Ideally, additional fill should be used to build up the fairways and eliminate some of the

depressions that are currently holding water. The effect of improved growing conditions with a deeper root zone can be seen quite clearly on the recently-built forward tee on Fairway #2. The addition of topsoil will achieve two things. Firstly, it can provide more room for the installation of drain lines to ensure adequate fall. Also, additional topsoil can be used to fill in depressions and contoured to provide surface drainage which is essential to reduce winter hydration damage. (see Winter Damage below)

Another key factor to reducing wet, unplayable conditions is to stop the water before it enters the property. The ditch beside Fairway #16 which was designed to capture run-off from the adjacent training ground has filled in and the sides have lost their integrity in some spots. Maintenance of this ditch is recommended to help reduce the water collecting on this fairway.

Winter damage

There are three principal causes of winter damage.

1) low temperature disease organisms

The low temperature diseases are also known as the snow moulds. The causal organisms are often active under snow but a snow cover is not always necessary for their development. Both the grey snow moulds (*Typhula* spp.) and the pink snow moulds (*Gerlachia nivalis* & *Fusarium* spp.) favour cool to cold, wet conditions and are aggravated by excessive nitrogen fertilization too early or too late in the growing season.

Chemical controls are available for the snow moulds. These are applied in the fall before the snow falls. Unfortunately the most effective family of chemicals are the mercurials which are no longer available. To effectively use the other fungicides to treat for snow mould it is advisable to identify which snow mould organism is active. For example, thiram will control *Typhula* spp. but is not effective against *Fusarium* spp. therefore, positive identification of the causal agents is essential.

2) winter desiccation

Areas of turf grass exposed to the winds without snow cover during the winter months are subject to moisture loss. This drying has the appearance of tip burn with the affected plants becoming the colour of straw. Less severely desiccated turf grass will recover once warmer weather provides conditions for active growth. The recovery will be slower than the surrounding plants.

Since it is the wind that removes moisture from the dormant grass plant, turf on higher, exposed areas such as mounds or elevated greens without windbreaks will be the most affected. The use of fabric covers is has been effective in reducing the amount of damage caused by winter desiccation. When using covers for wind protection the timing of removal in the spring is very important. The grass plants should not be allowed to grow too excessively under the covers before removal. A gradual hardening off of the plants by gradual exposure to the outside temperatures is necessary for the best results.

Snow is also a good insulator for desiccation and traditional wind breaks such as branches or snow fencing that encourage snow cover on the green can also reduce desiccation. This additional snow load may encourage snow mould activity and will also create more problems if the problem is actually winter hydration rather than desiccation. Therefore an accurate diagnosis

of the winter damage is needed to properly treat the affected areas.

3) winter hydration

Winter hydration is most common in older or poorly drained areas that may hold water in depressions. Good subsurface drainage will help to move water through the soil profile during the growing season. Good surface drainage is needed to move semi-frozen water off the turfgrass during the winter. Late fall or early spring rain is the principal cause of winter hydration damage. Water will sit under ice or snow during the day and be absorbed by the dormant grass plant. As the temperature drops at night the water crystallizes and expands when it re-freezes killing the grass plant. It is actually the thawing and re-freezing that damages the plant not the ice cover as we once thought.

Ice cover does provide an environment that promotes this freezing and thawing problem. Sunlight heats up the ground under the ice melting the ice layer from underneath. This water is taken in by the crown of the plant and the re-freezing damages the plants as described above.

Winter hydration appears to be the primary cause of damage on the Garrison fairways. The depressions must be filled in and surface drainage off the fairways is required. The quickest solution would be to strip and recontour the fairways. A more gradual method would be to fill in the depressions individually and start to topdress the fairways. The topdressing should contain at least 50% organic matter to avoid pockets of sand which will create dry spots.

Grass species selection and height of cut

The original Garrison fairways were probably seeded to a Kentucky bluegrass, perennial ryegrass, and creeping red fescue mix. This was, and is, a preferred mixture for the local climate. These grasses grow best at a height of cut of one inch or higher. They will withstand lower heights of cut, but become less vigorous and more susceptible to invasion by weed species such as native bentgrasses and *Poa annua*. Garrison's current height of cut on the fairways is 3/4 inch. This would explain the high percentage of native bent species and *Poa annua*.

The club's choices are as follows:

1. Encourage the bentgrass species

The current height of cut can be maintained and an overseeding program with bentgrass seed would be started. To effectively cultivate bentgrass fairways, the *Poa annua* population should be minimized. This is not easily accomplished especially since many of the *Poa* control products that are available in the United States are not registered for use in Canada. Collecting the clippings can help reduce the spread of *Poa annua*, but this is very labour-intensive and the current work crew is already fully occupied. The club must also budget to treat the fairways with fungicides, on a similar schedule as the greens. Regular verticutting is also required to keep the thatch layer in check. This need for de-thatching is not exclusive to bentgrass fairways. In fact, the fairways currently require verticutting to thin the thatch layer that has developed.

The benefit of a bentgrass fairway is primarily the lower height of cut and so-called tight lie. This allows better golfers to put action on a balata ball. This benefit is only appreciated by a very small percentage of any club.

2. Re-introduce dwarf Kentucky bluegrass / ryegrass / fescue blend

This would require an aggressive overseeding program and re-sodding of certain areas. The ideal time to renovate the fairways and restore them back to the original grass species is when additional fill and topsoil is added and recontoured to establish surface drainage. Clubs have re-established dwarf Kentucky bluegrass fairways by stripping and replacing the sod on one half of each fairway only to keep the course in-play throughout the construction. This process of resodding is very costly but the most effective method of re-establishing dwarf Kentucky bluegrass fairways.

The greatest benefit of the dwarf Kentucky bluegrass/ryegrass/fescue fairway is its ability to withstand Ontario winters. Some of the perennial ryegrass will fade out over the winter, but can be germinated quickly in the spring. The Kentucky bluegrasses are very winter hardy and less susceptible to summer heat stress related diseases. The height of cut must be kept at one inch or more. This can be dropped down to 3/4 inch for short periods of time for a tournament. The height is then raised after the event to reduce stress. Grown at this height, the Kentucky bluegrass will create a surface on which the ball sits up rather nicely. This makes fairways shots easier for the mid to higher handicap golfer. These are preferred conditions for older members as well.

3. Status quo

Maintaining the current cutting height and mix of grasses will provide a mixed culture that is quite playable. However, you can expect the low spots and poorly-drained areas to be dead each spring and become filled by *Poa annua* which may succumb to heat stress and summer diseases very easily. An aggressive program of filling in depressions and overseeding with bentgrass and perennial ryegrass is advised. The turf-type perennial ryegrasses will withstand the current height of cut but may not survive more severe winters. It will act as a nurse grass for the bentgrass to help combat the naturally-existing *Poa annua* seeds that will be present.

TREES

Many poplars were used in the original planting of the golf course. This was probably due to the desire to have large trees quickly. Unfortunately, poplars are short-lived trees with a very invasive root system. Short-lived means that they will become weak and start to lose limbs after about thirty-five to fifty years. The root system is fairly shallow and will seek irrigation in the turf. It is not unusual to find tree roots in the middle of a green or tee. They will even break the surface of the green and start to sprout.

Removal of the offending trees is the best measure especially if the tree is too close to fine turf areas such as tees and greens. The next best step is to thin the canopy of the trees to allow sunlight to penetrate to the fine turf areas and to root-prune the trees to slow down the invasion into the tees and greens. If the offending tree is in a strategic spot for the golf hole, a replacement tree of a better deeper-rooted species is recommended. A list of trees and shrubs that are native to Kingston is enclosed.

The tree in the middle of Fairway #10 has been badly beaten by golf balls over the years. It will probably last another ten years in very poor condition. If this tree is considered essential for the strategy of the hole, plans should be made to replace it. Planting another deciduous tree near the current position will allow you to remove the existing tree after a couple of seasons without substantially changing the look of the hole. Any planned change in the grade of the

fairway for drainage improvement should be done before establishing a new tree.

OTHER

The ponds are fairly stagnant and nutrient-rich from run-off. This encourages algae bloom to develop. Two elements are needed to clean up the ponds. More fertilizer must be removed from the run-off before it reaches the pond, and the addition of oxygen is needed in the ponds. Establishing plants from the reed and sedge families and other edge species such as bulrushes are very efficient scrubbers. They will extract most of the fertilizer and pesticide residues that may be in run-off. Planting oxygenating plants in the ponds and along their edges will also reduce the algae bloom. A list of native species is enclosed for your information.

A program that the club may wish to investigate is the Audubon Cooperative Sanctuary Program for Golf Courses. This program provides more information on naturalization of areas on the golf course and provides the club with an impartial wildlife group for guidance and to act as conduit to the public to promote any of the club's environmental improvements. A brochure on the program is enclosed.

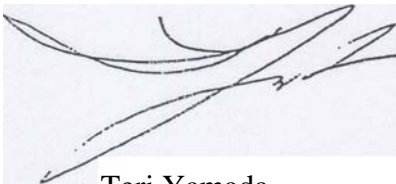
IN GENERAL

The club has developed nicely over the years. Drainage is the key to improving playing conditions. Extensive drainage work will net the club very notable results. The next element that requires attention is additional topsoil and regrading of some of the fairways. This should be completed before or during any irrigation renovations.

You have a very active membership and the club is well used. This makes the improvement to the drainage system even more important, as well-drained turf will withstand more traffic. Your level of play is also important when rebuilding greens and tees. It is always advisable to provide as many hole placements as possible to spread the wear. This does not mean that the greens must be enormous, rather, there should large enough flat areas for fair hole locations. The tees are rather small for the amount of play they sustain and the club is wise to continue the program to rebuild many of the tees.

I enjoyed visiting the Garrison Golf & Curling Club and look forward to monitoring the club's progress in future. Should you have any questions regarding anything in this report please do not hesitate to contact me.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Teri Yamada', is written over a light blue rectangular background.

Teri Yamada
National Director, RCGA Green Section