

## RESURFACING BENTGRASS GREENS

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Inverness Club is a Donald Ross course founded in 1903. The club has become noted for small, undulating, soil composition greens, of a push-up nature with little or no drainage installed. For the most part, the soil composition seems to work quite well. The soil profile does not reflect a wide variety of maintenance regimes, since I am only the fourth superintendent since 1903.

The greens were originally seeded to South German bentgrass. South German bent is a mixture of native grasses harvested from naturally growing fields in South Germany.

Over the years, the greens became contaminated with Poa annua. This left the greens with several varieties and species of grass growing on a single green. Cultural practices became increasingly difficult when faced with maintaining different types of grass during different times of the year. Uniformity and ease of maintenance were also a considerable problem. Cultural practices were often aimed at preserving the Poa annua instead of growing the desirable species. At different times of the season it was often difficult to identify which species were desirable. The quality of the putting surfaces was less than predictable, since disease often compromised the vigor of the Poa annua.

We visited several different clubs throughout the country and examined who had rebuilt or re-grassed greens using Pennlinks, Penncross, Providence, and Penneagle. Pennlinks was our unanimous choice.

Inverness Club selected Pennlinks because of aggressive rooting capabilities, fine texture, low affinity for scalp, and overall pleasing color.

The Green Committee was very concerned about the possibility of totally rebuilding the greens. We elected to re-grass since haul roads were not readily available and severe damage could be expected during the haul-in, haul-out phase of construction. There was also an inherent risk to the Donald Ross architecture and the cost of rebuilding was estimated to exceed \$400,000. The final cost of the total re-grassing operation was less than \$40,000.

We discussed re-grassing all eighteen greens, nine greens one year and nine the second year, or having a trial re-grassing process on two greens. The trial method was selected. We decided to re-grass the fourth green because of proximity and a practice green due to undulations and shade. We also established a nursery for experimentation.

At the time, I felt very confident in regrassing eighteen greens. I did recognize that the time table would be very tight and we would totally disrupt the golf season. In retrospect, the trial method was very beneficial to fine tuning my program and the membership felt more confident seeing a sample finished product prior to making the total commitment.

Work began on the remaining greens August 8th, 1988. All of the greens were aerified with the verti-drain using a 2 X 2.5 inch pattern. Next, the greens were aerified twice with a Ryan Greensaire using 5/8" tines. The cores were removed and the sod was cut with conventional sod cutters. We began removing the sod. Twenty additional employees, predominantly caddies, were hired for this operation. The sod broke into small pieces and this proved to be a very lengthy operation. I felt it was necessary to aerify through the sod rather than on bare soil to protect the smooth integrity of the putting surface. This process was entirely too slow. At the end of the first day only seven greens were ready for fumigation. We changed the process on the remaining greens and stripped the sod following the Verti-drain aerification. We then aerified with the Ryan Greensaire and removed the cores. Hendrix & Dale began methyl bromide fumigation on August 10th

and completed on the 11th. The plastic covers used during the fumigation operation were removed after 48 hours. The greens were then allowed to breathe one additional day.

Seed bed preparation began by verti-cutting with Ryan Mataways 3/8" deep in four directions at approximately 45 degree angles. The greens were then hand raked to assure a uniform depth preserving the original contour. The greens were allowed to settle overnight and then raked again. 10-18-22 predominantly soluble fertilizer was applied at the rate of 1/2 pound nitrogen per thousand square feet. The material was incorporated by raking a third time. Seeding was done with a drop spreader in two directions at a rate of 5/8 pound each direction. Granular metalaxyl was applied to prevent *Pythium* sp. The seed was incorporated by dragging the back side of a metal spring rake lightly across the green in two directions. Great care was taken to carefully position the rake so that footprints were removed in this process.

Evergreen covers were ordered to the specific size of each green. These covers were purchased primarily to prevent erosion during the germination and establishment phase. The covers had to be literally floated over the green similar to a parachute, to prevent any dragging that would disrupt the smoothness of the seed bed. A minimum of fifteen people was needed for the initial application of the cover.

In keeping with the entire summer, the weather was unseasonably hot during the regrassing operation. Temperatures in excess of 100 degrees were recorded daily. I was very concerned that soil temperatures were excessive for seed germination. When the seeding project was completed on August 17th, the temperature was 104 degrees.

The greens were irrigated with Toro 640 part circle sprinklers to keep the seed bed moist as well as cool. I found that thermometers were essential in determining the temperatures under the covers. Soil temperatures can run twenty degrees warmer under the cover in the sun opposed to the shade. I felt ninety degrees was the danger point and we used one minute sets of cool irrigation water, frequently at thirty minute intervals, to keep the covered seed beds below the ninety degree mark.

We received 1.78 inches of rainfall the first night that seeding was completed. The covers proved to be essential. Rain was exceptionally heavy at times. Some light washing did occur. The covers were carefully pulled back and the eroded seed bed was returned to its original state.

Fortunately, the rains brought cool temperatures. Temperatures did not exceed 84 degrees for the next four days.

Germination occurred after three days. The covers were very carefully removed after five days. We would return the covers with the threat of rain. The covering and uncovering process took approximately two and a half hours for each operation. After three weeks I felt there was no longer any threat of erosion so the covers were no longer needed until winter.

First mowing occurred at 14 days. By 21 days we were mowing regularly at 3 to 5 times per week.

The greens were fertilized with 10-18-22 using 1/4 pound nitrogen per thousand after 16 days. At first, fertilizer applications may have been too light, but I recall the wisdom Dr. Duich shared with me "...you can always add more." We began applying 1/4 pound nitrogen at four day intervals. Test strips of double applications were applied to chlorotic areas to determine if they were deficient in nutrition. Excellent response was noted from the additional fertility. We continued with the 1/4 pound nitrogen at four day intervals for two weeks and levelled off with 1/3 to 1/2 pound nitrogen per week. By late October we had applied four pounds of nitrogen per thousand. During seeding, especially in cool weather, I feel readily available sources of nitrogen are essential.

A second application of granular metalaxyl was applied at ten days to prevent *Pythium* sp. Light rates of iprodione were applied after 21 days. Light rates were reapplied at 14 day intervals in accordance with disease pressure. Iprodione and chlorothalonil were applied in combination for snow mold.

After nine weeks, the greens were being mowed regularly with Toro series V mowers at a height of .240 inches. We shifted to the Toro series IV mowers because of the fixed head and solid drive roller configuration. We then raised the height of cut to .280 inches and began our topdressing program.

The topdressing was a laboratory tested 80/20 material. Topdressing began on October 15 using approximately 2 1/2 cubic feet per thousand. The material was worked in carefully using standard tennis court brushes. Three applications were applied during the fall, in accordance with the rate of growth.

The greens were rolled with a Toro series IV greens mower in two directions on March 10th, 1989. The greens were mowed on March 15th and on a regular basis after March 27th. The first spring was at a height of .250 inches.

We began topdressing in late March and continued at 10 day intervals through April. The mowers were lowered slightly every other time we mowed. Frequent topdressing enabled us to attain a cutting height of .165 inches by late April. The greens were opened and ready for play May 1st. At this time putting green speeds were in the upper eight foot range. Top dressing continued through the season at 1-2 week intervals at extremely light rates. These rates were light enough not to interrupt play or injure the turf. I feel that topdressing frequently is critical to smoothing the putting surfaces at Inverness Club. The greens were not perfectly smooth as a result of some minor washing caused by a thunderstorm the night after seeding. These spots were still evidenced by some very minor scalping the first season.

We have continued the light frequent topdressing to date, trying to match the rate of growth and the frequency of topdressing. We were able to avoid layering with the initial topdressing and have remained essentially layer free.

As I look back, the bottom line is get it right the first time. Timing is critical. Too often I see clubs wait for a club event to delay projects, only to compromise results. Be patient. Do not force low cutting heights. Scalping the first season is usually catastrophic.

After establishment, I have tried to maintain a respectable cutting height, balanced nutrition, and proper irrigation. The Verti-drain is used twice annually in October and November. I have tried a variety of Poa programs and feel cultural management is essential. To this point, I have not found a successful chemical program to eliminate Poa annua.

One Poa strategy is not to use fungicides that control diseases of Poa annua. Naturally occurring diseases can suppress Poa under ideal conditions. Recently, I have seen an increase in "Take-All" activity on the greens. As I began using Thiophanates and DMI type fungicides, the vigor of the Poa increased and Poa populations began to increase. Last season I saw a dramatic increase in Poa populations and as the 1996 season approaches, I feel threatened for the first time.

Inverness Club and myself would like to thank Dr. Joe Vargas for all of his help with this and other projects throughout the years.