

Sand topdressing can be a short-term solution. Rebuilding is long-term.

Modifying greens— Topdressing and rebuilding

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Remedy for problems—Old

Fourteen years ago I took the position of Superintendent at the Louisville Country Club, and one of the major problems that I noticed right from the start was the heavy thatch conditions that prevailed on all of the greens. The bad part of the problem was that the members liked the thatchy greens because the cushion made up for a poorly hit shot and the ball would hold on the green. The thatch was so bad that you could reach inside the cup and pick up the turf like it was a carpet. The roots wouldn't even penetrate the thatch into the soil layer. The thatch was a good one and one-half inches thick.

I informed the greens committee that the thatch was going to go. They couldn't have been more cooperative, and were prepared to take the flack from some of the membership, especially some of the older members who had grown accustomed to the spongy greens. Another important point to mention here is that only about two of the greens had any tile under them, and they were all composed of a very heavy clay mixture. The physical construction of the greens was a thatch layer over a clay base, and that was all. Not to detract from my predecessor, because he did what he could, but his hands were tied. They didn't even want a Greensaire on the greens. Consequently, he had to use an old Wespoint aerifier, and it wouldn't even penetrate the thatch.

For the first few years my program was that of aerification vertical thatching, using a mat-a-way with knives on two inch centers, removing both the cores and thatch and then topdressing. The program I used at that time was not readily accepted by most people; I had to make the choice after some serious deliberation and elimination. In coming up



with the topdressing mix, I eliminated any peat, mainly because of the already present heavy organic layer. That left sand and soil. It was difficult to get a good grade of soil that would not ball up, so to speak, when mixed with washed sand, and in view of the fact that Dr. Daniel was doing extensive work with calcined clay at the time, I felt that mixing the medium washed sand with the processed clay would give me a good consistent mix that would not only true up the putting surface but at the same time would drag into the aerifier holes and vertical slits easily.

We applied the material quite

heavily, 1/4 to 5/16 inch, and worked it well into the green. Due to the shock not only to the green, but to the membership, we did this just two times a year—in the spring and fall. After a period of about two years, we could notice the thatch really starting to disappear, and after the third year, it had been completely decomposed. We had also pushed our roots down to the five or six inches and had a good, resilient putting surface.

I know that you hear a lot about "layering," using a different material on the topdressing program than the green is composed of. I disagree with that theory and have six

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greens of the old construction to back up my theory. The thing that I do agree with is that once a sand topdressing program has been started, it is necessary to stay with it and not switch back and forth, because then you will get layering.

Twelve of our greens have been rebuilt since I started the sand topdressing program, but the topdressing program on the old six greens has not changed in fourteen years. I have had some people say that the calcined clay could be eliminated, but if I did so, then I would have to change the topdressing material, and, as a good friend with many years in the field of turf management and construction told me, "Boy, something that works for you and is doing a good job, don't mess it up."

That pretty well sums up my feeling also. It has been a good program and has worked well. These old greens will be replaced with new greens of U.S.G.A. type construction within the next year, but the sand topdressing program will continue until they have been rebuilt. The main reason—because it works.

Remedy for problems—New

Of the many various methods of construction used to build a putting green, the U.S.G.A. method is probably the most accepted as being the "successful" way to properly construct a green. The U.S.G.A. method of layering has been refined and tested for a number of years, and if all of the proper steps are followed in the right sequence, then a correctly built green with many years of service should be the result.

If you are considering rebuilding one green or your entire course, then the first step is to acquire the services of a competent golf course architect. I have seen too many greens that have been designed by the superintendent or a member of the greens committee that have been disasters. In our particular case, we secured the services of David Pfaff, whose work was quite reputable. His design kept the existing character of the course yet gave an innovative flare to the new greens to be built.

A committee was established consisting of the superintendent, golf pro, and two members of the greens committee. Once the board of directors had approved the construction of three of the greens, it was the job of the committee to work with and approve the design of the architect. This project was to be done over a period of six years, by doing three



greens each year. As soon as the board approved the project, we began mixing our topmix. In wanting to stay away from any soil at all, we sent samples of the sand and peat to Texas A & M University for analysis for the U.S.G.A. Soils Testing Laboratory. Their recommendation was to use eighty percent of the sand, which was classified as a medium wash, and twenty percent of the Millburn peat. This material had a percolation rate of 7.4 inches per hour. We mixed off-site starting in June, using two front end loaders and a Lindig soil shredder. Using two loaders and mixing the material before putting it through the shredder, we found that two men could mix about one hundred tons in a six-hour day. The high sand content made it necessary to clean and change the oil on the breathers and crankcases of all equipment used each day. We were able to mix two thousand tons in about one month's time.

The sod was removed from the green the morning that the construction was started and used to establish a temporary putting green. This lessens the shock to the membership and gives them a satisfactory surface to putt on during the construction. The architect's job is finished once he gives us the final draft of the blueprints. As far as the staking and grade work, this should be handled by the superintendent. Using a transit properly is part of his professional requirements. The two main stakes to be considered

throughout the construction are the center stake and the backsight stake which is established in the center of the fairway. The backsight stake is absolutely essential in that it allows the green to be properly oriented with the fairway. If a cut or fill is required then the center stake and four others will suffice until a rough grade is reached. The green can then be staked on sixteen points with the proper grade marked on each stake. This just speeds things up for the operator.

The base grade of the new green should roughly conform to the finish grade, except that it will be eighteen inches deeper. Once the base grade is established, the next step is to install the tile lines. In our case, the design of the tile system varied with each green, with a minimum spacing of twelve feet and a maximum of twenty. The main thing to keep in mind is that they all have the proper fall. We used four inch ADS plastic perforated tile with a half-inch gravel to bed and cover the pipe.

The gravel bed can be spread by one operator using a tractor with a blade or grader box and a laborer to hand rake the tight spots next to the edge and around the stakes. The gravel can be tucked right to the green, and ten to twelve-ton loads on tandem trucks helps to reduce tracking on the course.

The coarse sand blanket can be spread in the same manner as the gravel blanket. A spot check from time to time by the superintendent helps insure the quality of this in-



stallation. A sandtrap rake is an ideal tool to level the sand blanket, especially when working around the grade stakes.

By this time the work force and the entire project is going to be spread out pretty far. The superintendent and heavy equipment will be working on the last green or the third green, depending upon how many you plan on doing. The tiling crew run by the assistant should be working on the second green, and the operator and laborer spreading the gravel and coarse sand will be working on the first green. Once you get spread out like this, there is a tendency to pick a couple of the men from your regular crew to help with the construction. Don't make the mistake of letting the routine maintenance on the course go simply for the sake of the construction. You still have a primary obligation to provide as good a condition as possible to the membership. If this declines, then you open yourself and everyone involved to criticism. If you need a couple of extra men and you are pushing against the weather and/or the calendar, then hire them. You should have added at least a ten percent contingency fund to the total construction budget anyway. (While on the subject of contingencies, let me say that there will definitely be some. Things such as old water lines, and tile lines, along with existing

irrigation lines and wires will have to be contended with. One good bite with a backhoe into a couple of dozen irrigation wires can put havoc into your day. Learn to take these things in stride. Broken pipes and delays due to the flooding they cause are a way of life in reconstruction, no matter how well you plan the procedure. It is the quality of a good supervisor to be able to handle these contingencies as efficiently as possible without disrupting the overall project.)

Filling the green is probably the largest single phase of the operation. Here is when you get on the phone and use the "beg, borrow and steal" method and round up four or five dump trucks from nearby courses. All of the clubs in our area have been most generous and often send an operator for a day or two. Two front end loaders can keep the trucks filled, especially after they get spread out traveling from the mix area to the green site. A small track type of high lift is ideal for handling the mix and spreading it onto the new greens. We usually rent a Case 350 for this job and it handles the material well and also does an excellent job of compacting it. Once we get it out on the green, then the dump trucks drive right out onto the fill areas and dump their load. This eliminates having to push it so far with the high lift. We have never had

any problem with compaction with the trucks pulling out on the green. With any kind of luck you can fill three greens in a twelve-hour day. Remember those grade stakes that you put in earlier? Once you have reached grade line on them, they can be pulled. It will be necessary to have a transit set up to check the final contours on the green and you can expect to take about four hours per green putting in the final contours using the tract type high lift and a tractor with a grade box. Once the contours have been established, then get the committee together to make sure that everybody involved agrees with the final shape of the greens. I have experienced a situation where we had seed germinated and changes had to be made because "someone" didn't approve of the architect's design. This, however, shouldn't be a problem if everyone on the committee knows anything at all about reading blueprints.

The next step is to incorporate the starter fertilizer and seed the putting surface. We used Penncross Bent at two pounds per thousand. Knowing the size of each green, the seed was weighed out and applied in three directions to insure good coverage. We have had our best results with lightly raking the surface after seeding and then rolling it. The green and sandtraps are then rimmed with sod, two rolls wide. This helps to define both and helps keep the proper design of the green.

We have been involved with constructing the U.S.G.A. type of green for four years and are more than satisfied with the results. If you plan this type of construction as far in advance as possible, it will eliminate a lot of problems. It can be done smoothly and rapidly. The last four greens that we built took twenty work days from start to finish, which averages out to five days per green at a cost of \$1.10 per square foot with thirteen greens now completed. This cost figure includes everything except the white sand for the traps.

If you are going to take the time to build a green, then do it right the first time. **GB**

Answers to turfgrass insect identification quiz

A. Masked chafer adult, *Cyclocephala* sp.; B. Greenbug, *Schizaphis graminum*; C. Bluegrass billbug larva, *Sphenophorus parvulus*; D. Clover mite, *Bryobia praetiosa*; E. Hairy chinchbug nymph, *Blissis leucopterus hirtus*; F. Bronzed cutworm larva, *Nephelodes minians*; G. Winter grain mite, *Penthaleus major*; H. Southern molecricket, *Scapteriscus acletus*; I. Black cutworm adult, *Agrotis ipsilon*; J. Sod webworm larva, *Pediasia trisecta*; K. Hyperodes weevil adult, *Hyperodes* sp.; L. **Rhodesgrass scale**, *Antonina graminis*; M. Japanese beetle adult, *Popillia japonica*; N. Fritfly adult, *Oscinella frit*; O. Armyworm larva, *Pseudaletia unipuncta*; P. Black cutworm larva, *A. ipsilon*; Q. Hyperodes weevil larva, *H. sp.*; R. Ground pearls, *Eumargarodes* sp.; S. Hairy chinchbug adult, *B. leucopterus hirtus*; T. Bluegrass billbug adult, *S. parvulus*; U. Vegetable weevil larva, *Listroderes costirostris obliquus*; V. Sod webworm adult, *P. trisecta*.