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The number three fairway was a mottled mixture of bentgrasses and *Poa annua* prior to renovation.

# Renovating



After the fairways were killed with Roundup, a seed drill planted 50 pounds per acre of new bentgrass.

Older golf courses in the U.S. have a unique place in today's golf world. Like fine, old yachts, they were built to different standards and require periodic retrofitting.

Like mahogany has been replaced by fiberglass on yachts, old bentgrass greens, now mainly *Poa annua*, are being renovated and replanted with more durable bentgrasses. As sonar and radar have replaced older navigational instruments on boats, sand traps, berms and contour mowing have been incorporated to help guide golfers through older courses.

The similarity goes further. Golf courses don't face heavy seas, but nature does have its way of fooling the best superintendents. Unfortunately, it often takes a disaster to alert some greens committees to the vulnerability of their course, a vulnerability that could be reduced by periodic renovation and retrofitting.

Such a disaster occurred in 1983 when the Toronto bentgrass (C-15) greens at Butler National Golf Course in Oakbrook, IL, mysteriously died a few weeks before the Western Open, a major televised golf tournament. Experts in turfgrass diseases from Virginia, Ohio and Michigan were rushed





Riverside Golf Club members hit their first drive onto the renovated number one fairway which is now a dense stand of bentgrass cut with light-weight triplex mowers.

# Riverside

to Chicago to examine the greens, discover the cause and determine a cure. But time ran out. The only solution was to dye the greens to mask the tan turf for the television audience. The dye, however, did not cover up the words of television announcers who revealed the embarrassing dilemma to millions of viewers.

Many older courses in the Chicago area had Toronto bent on their greens at the time. They didn't face the same scrutiny as Butler National, but there was no escaping the fact that the wilt could kill their Toronto as well.

One was Riverside Golf Club in North Riverside, IL. Riverside has operated as a private golf club since 1893, longer than any other golf club on its original site west of the Allegheny Mountains. Superintendent Roger Stewart had experienced this mysterious decline of Toronto bent at his previous course, Midlane Country Club in Waukegan, IL. It had been labelled red leaf spot by superintendents who could find no cure among the fungicides at their disposal. He knew seven of his greens at Riverside had been renovated to Toronto in the early '60s.

As an officer of the Midwest Association of Golf Course Superintendents and a board

member of the Chicagoland Golf Course Superintendents Association, he heard the concerns of fellow golf course superintendents at meetings. He knew the threat Toronto decline represented to courses and to superintendents' jobs.

While the experts drew differing opinions, Chicago area superintendents felt the solution would involve renovation of older Toronto turf to newer, improved bentgrasses. Finally, the experts agreed it was a bacterial wilt, not a fungus, that attacked Toronto specifically. The cure was the antibiotic tetracycline, a costly treatment when you need to treat thousands of square feet of wilting bentgrass.

Stewart, with the confidence of a captain of a solid vessel, did not run to his greens committee with a proposal to renovate all Toronto greens at Riverside. "Toronto is still one of the finest putting turfs for this area," Stewart defended. "Few bents can match its rich green color and density.

"After all, when your members are happy with your greens and they aren't asking you to copy the ultra-fast greens of the professional tour that live under tremendous stress, renovation is something you can do over a period of years. A few of our greens

have the original bentgrass from 1893. The majority are Washington bentgrass installed when the course was expanded in the '20s. In fact, a predecessor of mine developed a bentgrass called Riverside which can still be found on other golf courses in the Chicago area.

"For me to go to the greens committee and suggest what we had been doing for the past 93 years was wrong would have been a mistake. After all, the Toronto had been installed in the '60s, not very long ago for a nearly 100-year-old course.

That's not to say renovation to newer bentgrasses in light of the Butler National incident was wrong either. Stewart decided it was just a matter of time before the wilt would spread to Riverside. He determined the thing to do was to explain what happened at Butler and recommend a phased program of renovation over a period of five years. They agreed the thing to do was to fumigate and renovate three or four greens each year to either Penncross or Penneagle.

Another reason Stewart, a University of Nebraska turf graduate, didn't want to go overboard on the greens was he had another program underway. When he came to River-

*continued on page 24*



side in 1979, the fairways were more *Poa annua* than bentgrass. The maintenance program over a period of years had actually encouraged the *Poa annua* to the point that it was dominating the bentgrass on the fairways. The fairways looked splotchy with light and dark green turf. They irrigated heavily and had to apply Tersan-SP for pythium control regularly. "I thought we could cut both water and fungicide costs if we started managing the fairways for bentgrass instead of *Poa annua*," said Stewart.

After two years as superintendent, Stewart presented a five-point program to renovate the fairways to the greens committee. He told them it could be done over a three year period without closing the course. The only restriction was carts could not be driven on renovated fairways until they were fully established. He got the go-ahead.

"The first step was to kill the existing turf with Roundup," explains Stewart. Then the fairways were heavily aerified and the cores broken up by a Mott flail mower. After dragging to evenly distribute the debris from the cores, a Rogers seeder drilled in 50 lbs. of Penneagle per acre.

"One thing you have to realize about renovation with Roundup is the grass you killed becomes a layer of thatch," points out Stewart. "You are trading one problem for another, annual bluegrass for thatch. It takes three years of aerification to get the thatch back to normal levels."

"The success of the entire program rested on the next four steps," stressed Stewart. "If we allowed the *Poa* to reinfest the new bentgrass all would be lost." As soon as the Penneagle was established, the fertilizer ap-

plications were cut in half. Instead of four pounds of nitrogen per thousand square feet per year, just 1¾ pounds was applied to the fairways. That's a lean diet for any bentgrass.

To help the Penneagle withstand this stress the amount and frequency of potassium applications was increased. "I just didn't think one application in late fall or early spring stayed in the soil long enough to help out the bentgrass during the summer stress period," Stewart explains. "So we changed our program to apply one pound per thousand square feet of potassium (sulphate of potash) six times a year." Sulphate of potash has a low burn potential and contains sulfur, another important mineral for turf.

As Stewart trimmed the nitrogen out of the Penneagle's fertilizer diet he also applied the lean treatment to water on the fairways. "We are extremely dry here all the time," he reveals. "Where we once watered the fairways nearly every night in ten-minute sets, we now water less than 10-13 times during the entire year! "Certainly if there was a drought that would change, but we let the bent go a little off-color before we even think about irrigating the fairways. There's no question we're hurting the *Poa*."

When Stewart does water he soaks the fairways and injects a wetting agent into the irrigation system if bentgrass wilt symptoms are uneven. He's ever mindful of the thatch and the problems it can present during irrigation.

The final step, until recently, was light-weight fairway mowing and clipping removal. There are three benefits to this procedure. Light-weight equipment compacts the surface less than heavier tractors pulling reel gangs. Annual bluegrass has the advantage

over some bentgrasses in compacted soil, one reason why Stewart aerifies the fairways each year with a Ryan Greensaire.

The light-weight mowers, with three to five reel units, leave an attractive pattern across the fairways which highlights the contour of the course. Finally, by picking up the clippings and seed heads, they reduce the spread of *Poa annua* by seed.

Instead of buying a new light-weight mower with baskets, Stewart converted one Toro Greensmaster and one Toro Turf Pro 84 used for banks and fringes around greens so they could be used on the fairways. The cost of a Jacobsen HF-5 fairway mower was added to the budget for the following year. "By converting equipment initially we kept costs under control and still got what we needed," claims Stewart.

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***"Where we once watered the fairways nearly every night, we now water less than 10-13 times during the entire year!"***

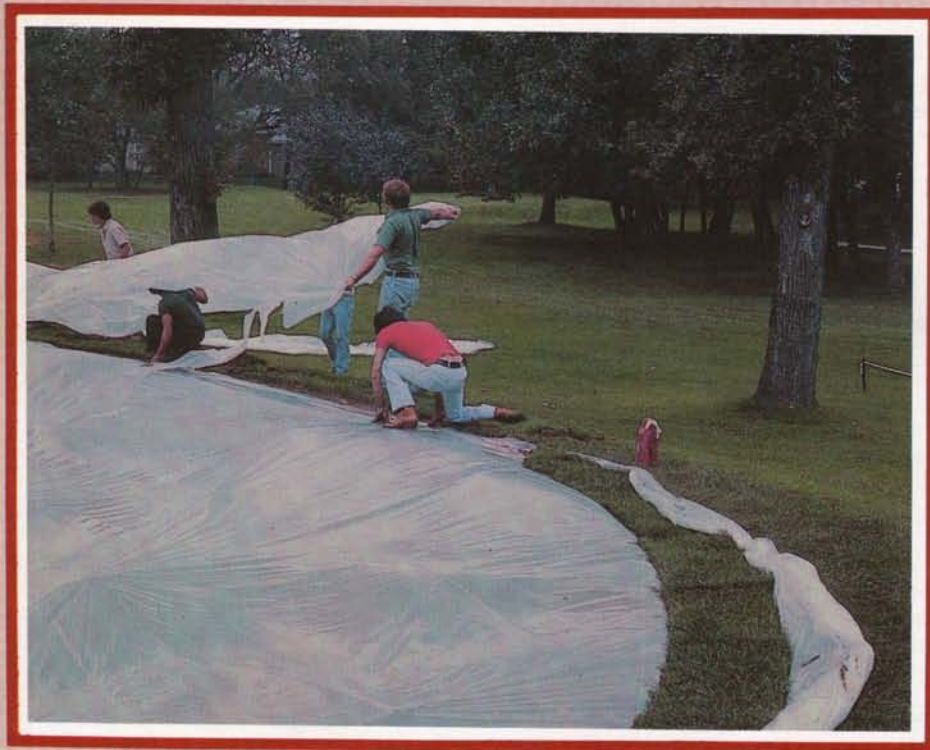
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With his five-point program in progress Stewart continued to listen to his fellow superintendents and area suppliers. "Jim Halloran, who was then our salesman from Arthur Clesen, Inc., told me about Cutless, a growth regulator under experimental use which selectively discourages *Poa annua* in bentgrass turf. Elanco, the manufacturer, was looking for Chicago-area superintendents willing to try the product. Considering the investment the course had made in fairway renovation, I thought we should try it on one fairway. It was also a chance to be a step ahead of the game."

After two years of experimental use, Stewart has determined Cutless will be the sixth step in his *Poa annua* defense program when the growth regulator receives full registration from the Environmental Protection Agency.


"I'm beginning to believe that we can beat annual bluegrass by using a combination of hardy bentgrass, less water and nitrogen, light-weight fairway mowing and growth regulators," states Stewart. "Some superintendents might think getting rid of annual bluegrass is a senseless obsession. It might be if you don't control your costs. Control is the whole idea. You don't have control when your greens and fairways are infested with *Poa* or bentgrasses highly susceptible to wilt. We've made these changes without breaking the budget and without

continued on page 28



The Toronto bentgrass greens are being fumigated with methyl bromide and seeded with Penneagle bentgrass over a four-year period.





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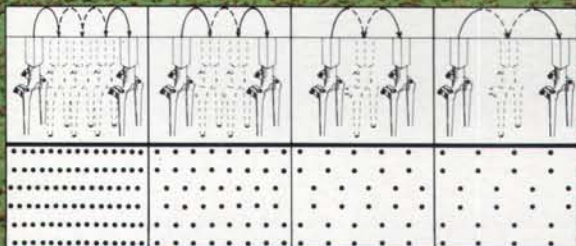
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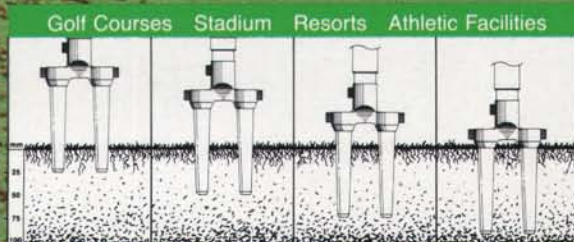


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# CHALKBOARD

## TIPS FROM THE PROS

### **Aeration Can Reduce Player Injuries**

By Harry O. Wilcox

Injuries to football players are being reduced as more coaches and turf managers realize the importance of maintenance, but there is no universal solution to poor athletic fields. The management of turfgrass for athletic fields varies from East to West, North to South, seashore to mountain, swamp to desert. In short, no two fields are alike, so how do you develop a turfgrass management for your specific fields?

When seeking advice, you must remember that the needs of sports turf are different from home lawns or utility turf. Many may offer advice, but you must locate someone who is familiar with your special needs and conditions. Even local gardeners and golf course superintendents who are experienced turf managers may not fully appreciate your needs.

Local extension agents are usually familiar with an assortment of local sports fields. Furthermore, they are able to get assistance from state extension specialists versed in sports turf. In many cases, they have developed specialized guidelines for sports turf in your area.

One area of prime importance is aeration, also called core cultivation. The soil of most athletic fields contains some clay or silt which favors soil compaction. The soil on sports areas should have a granular structure with space for both air and water. A healthy soil is well supplied with microorganisms. They help break down organic matter and make it suitable for plant use. Air is needed for microorganisms to thrive and reproduce.

The following story illustrates the value of aeration. While setting up a demonstration on a football field in Ridley Township, PA, I laid out 30-foot-wide plots across the field using the 10 yard lines as dividers. Four pounds of nitrogen per 1,000 square feet were applied to one section and no fertilizer was applied to another section. Half of both sections was aerified four times.

The results were amazing. Some of the aerified, unfertilized plots compared favorably with adjacent fertilized plots that had not been aerified. The plots that received both fertilization and aerification were definitely better than those receiving just fertilization or aerification.

Timing of maintenance operations can affect results. Aeration before fertilization or seeding will speed up response of the turf. Aerating helps water penetration and

### **Protecting Bench Turf**



**A bench tarp can protect natural turf underneath and preserve the appearance of the sideline areas of a football field.**

The worst damage to a natural turf football field is not between the hash marks, it's on the sidelines in front of the bench. Pacing coaches and players can turn the turf in front of both benches into bare low spots in just a few games. Rain and irrigation will then turn these areas to mud.

One solution developed in the last two years and installed at a number of professional stadiums is the bench tarp. These are made of bonded polyester which allows both air and water to pass through. The fabric cushions the turf and distributes the weight of players and equipment on it.

The tarp can be placed over the bench area in wet or very hot weather without suffocating the turf. The idea is to install

it before the game and remove it afterward. It is best to remove the tarp no later than the morning after the game. Six-inch 60D nails with washers are used to anchor the tarp through grommets along its front edge. Tape is available to stick the tarp to the turf along its sides and back, but benches and equipment on the tarp usually keep it in place.

Emory Hunter of Warren's Turf, the manufacturer, recommends that no chemicals or pesticides be applied to the bench turf area within seven days of installation of the tarp. Hunter says the tarp should last several seasons and can be washed with soaps or detergents.

conserves costly irrigation water in dry times. The effect of lime can also be improved by aerification.

*EDITOR'S NOTE: Harry Wilcox is a retired turfgrass extension specialist living in Wellsboro, PA. He has been a consultant to sports turf managers for more than 40 years.*

### **White Grub Control**

If you are following a regular program of fertilization, aeration, irrigation and mowing and still find thin, yellow turf, James Jarratt, extension entomologist for Mississippi State University, says the culprit might be white grubs. These are the larva of insects such as June beetles, Japanese beetles and the black turfgrass atenioid beetle. During late spring and late summer these larva feed on the roots of a wide variety of

turfgrasses. Severe infestations damage so many roots the grass can be easily lifted out of the ground.

Jarratt says you can make sure if white grubs are the problem by removing cores of soil three inches wide and four inches deep and examining them. Remove enough cores to make a total of one square foot of soil. If you find more than four grubs in one square foot of soil, Jarratt says you should apply pesticides.

The strategy is to get the pesticide in the rootzone when the grubs are nearest to the surface, generally late spring and late summer. Jarratt says pesticides must be irrigated into the soil with 1/2 to 1 inch of water if they are to be effective against white grubs. Effective pesticides include Diazinon, Dylol/Proxol, Oflanol and Sevin. Never apply pesticides without carefully reading the label and following label instructions exactly.



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## Renovating Riverside

*continued from page 24*

straining the relationship the greens committee has with the membership.

The renovated fairways are dense and dark green. Members have a uniform surface for fairway shots. The results are there for all the members to see.

Stewart has been able to cut his fungicide budget and his water budget. Even the equipment budget is under control. "We don't spend more, we just purchase different equipment," he explains. Everything has been phased in to accomplish goals without going crazy. "That," claims Stewart, "is not obsession. It's keeping this respected, old course current with today's technology."

Riverside's retrofitting doesn't stop there. In 1976, the Club commissioned golf course designer Larry Packard to develop a ten-year plan and purchased an option to buy 20 acres adjacent to the course for expansion. In his plan, Packard included a driving range, three new holes, sand traps and berms. The Club is currently working with golf course architect Dick Nugent as it prepares to exercise its option to expand. Construction will begin soon on a new clubhouse.

"We've spent a lot of time on the sand traps," says Stewart. Nugent likes the sod-faced traps found on Scottish courses. The sides of these traps are stacked-up sod. They discovered when they removed the sand from the traps that edging the sides over the years had made them larger than indicated on plans dating back to the 1920s. The traps were reshaped, drainage problems corrected, liners installed and the sides and edges resodded. These steps were taken to cut down on loss of sand and dirt getting into the sand. In the process, any sod around the traps infested with *Poa annua* was removed. The traps looked sharp when they were finished.

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***"You can say we have  
as much to learn about  
going dry as we did  
when we went lush."***

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Riverside has also periodically retrofitted its irrigation system. From 1893 to the '20s it was up to nature to supply the course with necessary water. Greens and tees were hosed down by hand on the hottest and driest days. In 1926, a manual system was installed for just greens and tees.

It wasn't until 1964 when a center-row, quick-coupler system was added to the fairways. The semi-automatic system brought a whole new dimension of turf maintenance to the fairways. "It was really the beginning of a high maintenance program for the fairways," says Stewart. As superintendents

applied more water to the fairways, they also increased the amounts of fertilizers, herbicides and fungicides. Turf was being pushed to new limits.

The year after Stewart became superintendent at Riverside, the irrigation system was upgraded to a Toro VT3 automatic hydraulic system with Model 690 heads on the fairways and Model 650 heads on the greens and tees. Stewart had greater control over the updated system and planned to use it. "You need a modern system if you are going to cut back on water," Stewart states. "It may seem strange to have a modern system for the fairways when we're irrigating only 10 to 13 times a year, but you have to realize that each drop of water counts more in a dry program than it does in a lush, heavily irrigated situation."

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***"I thought we could cut  
both water and  
fungicide costs if we  
started managing the  
fairways for bentgrass  
instead of Poa annua."***

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"You can say we have as much to learn about going dry as we did when we went lush," says Stewart. "Trying to find the right point between too wet and too dry is going to take a lot of time and study. We don't want another disaster."

That is a big reason why the Chicagoland Golf Course Superintendent's Association has raised \$150,000 to fund a turfgrass advisor just for their area for the next three years. Dr. Randy Kane from Cornell University, Ithaca, NY, has already been hired and set up with a lab and growth chamber. "His laboratory research may prevent further surprises from damaging our older courses," Stewart predicts.

Riverside Golf Club has survived almost a century since it opened with six holes in 1893. It has a history of regular upgrading beginning with its expansion to 18 holes by golf course architect William Boise Langford in the 1920s. Larry Packard gave it a ten-year plan in 1976 and Dick Nugent is reshaping the course to meet the needs of another decade or more. But, it takes superintendents like Roger Stewart to make the maintenance as up-to-date as the design without losing control of the course or the budget.

The game of golf was spawned on Scottish courses much older than Riverside. But, it took root in the Midwestern United States in the late 1800s on courses like Riverside. That tradition can never be erased, only preserved by continuous and well-thought out renovation. ●



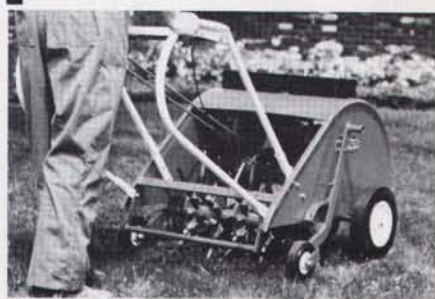
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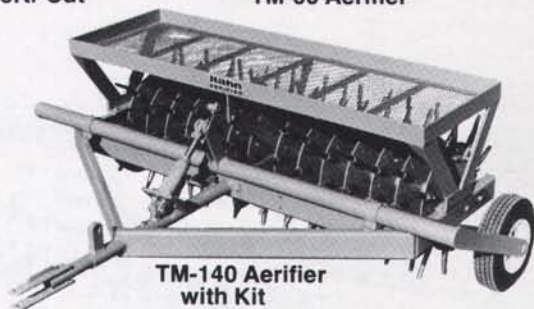
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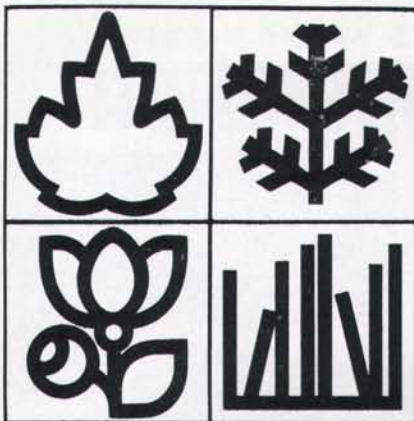
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## VIRGINIA TURF TESTS KEYED TO SPORTS TURF

The Virginia Extension Service has replanted an athletic field demonstration area in Annandale, VA, to update results it obtained from a 1979 test of different turfgrass types. In 1979, the tests indicated a weakness in zoysiagrass, bermudagrass and tall fescue to withstand athletic field traffic and Virginia winters.

Dr. Jack Hall from Virginia Tech and Dr. Jack Murray from the USDA Research Station decided to use Wakefield Park in Annandale again to discover gains made in fine-bladed tall fescues and seeded zoysiagrass. The area was replanted last year and will be shown during a demonstration June 18.

Preliminary results indicate the seeded zoysia plots did not perform as hoped with only 18 percent ground cover after two months. The fine-bladed tall fescues achieved 90 percent coverage in three months compared to 70 percent coverage for K-31 tall fescue. New perennial ryegrasses also achieved 90 percent cover. Sprigged Vamont bermudagrass had complete coverage but previous tests showed poor winter hardiness.

Hall believes these types of local demonstration tests under actual use conditions will provide the best information for sports turf managers.

## TURGEON APPOINTED HEAD OF AGRONOMY AT PENN STATE

Author, businessman and turf research specialist Dr. Al Turgeon has assumed the position as head of the agronomy department at Pennsylvania State University, University Park, PA. Turgeon succeeds Dr. James Starling who was appointed associate dean of administrative affairs for the University's College of Agriculture in 1985.

Turgeon has vast experience in both the business and technical sides of the turf industry. Most recently, he was vice president of support services for Tru-Green Corp., East Lansing, MI, the second largest lawn care company in the country. Since 1983, when he joined Tru-Green, the company's sales doubled from roughly \$20 million to \$40 million.

Prior to joining Tru-Green, Turgeon was professor and director of research for the Texas A&M Research and Extension Center in Dallas, TX, where he managed the unit's research program in an administrative capacity.

He started his research career as a student at Rutgers University, New Brunswick, NJ, and Michigan State University in East Lansing, MI. He continued his research as associate professor of turfgrass science at the University of Illinois.