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Green Section RECORD

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*Cover Photo:
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Long-range planning prevents costly rebuilding.

Working Nine to Five?

by **CHARLES B. WHITE**,
Director, Southeastern Region, USGA Green Section

IS A GOLF course superintendent a businessman? Well, he doesn't go to the office each day in a three-piece suit with briefcase in hand, but he *is* a businessman. Areas such as public relations, budget preparation, equipment depreciation, labor justification, personnel management, maintenance facility upkeep, and long-range planning are all parts of business management, but they're seldom given enough emphasis in golf course management education or in the superintendent's job description.

Learning how to relate to the board and green committee is a critical part of the golf course superintendent's job. It is important to realize that, as businessmen, they relate best to business terms (e.g., miles versus hours on equipment). When communications are geared toward intended ears, budget proposals and project selling have a much higher

batting average. The golf course superintendent, who gives the maintenance program continuity through myriad changes in the green committee, must constantly reinforce the distinction between the needs of the club versus the desires of individual golfers when dealing with the committee.

Public relations is a facet of golf course management that many golf course managers overlook, but when it comes down to the real issues of the golf course superintendent's profession, good public relations may be the most important factor leading to success and credibility. Many turf managers who are excellent agronomists lack effective communication and public relations skills. Consequently, they usually are not as successful as those who have developed skills through education and practice. Effective communication is

not easy, but these skills can be dramatically improved when they are developed through proper channels. Continuing education is one of the best means of improving public relations specialties such as personnel management, communication skills, public speaking, and business management. As the superintendent profession continues to upgrade itself educationally, technically, and scientifically, it will put a premium on the superintendent's ability to handle public relations. This includes communications with the membership as well as with those employees who may lack formal education. Budget preparation and presentation could also streamline golf course management. Golf course budgets oftentimes are the dumping ground for odd and end budgetary expenditures, such as golf cart, swimming pool, and tennis court mainte-

nance. Some clubs may show large bottom-line budgetary figures, but the money really available for actual golf course maintenance (equipment maintenance and repair, fertilizers, chemicals, and labor) is relatively small. These four particular line items must be presented to the board so it realizes their importance and so that budget dollars can be appropriated to develop the needed maintenance programs. If these four items are not properly funded, then the overall maintenance of the golf course will not be up to the level anticipated or wanted by the golfers.

WHEN BUDGETS are presented to the board, it is important not only to show figures for each line item, but also to include an explanation and justification for each one. Businessmen want to see where money is going and why. Golf course budgets are upgraded more successfully through proper preparation and presentation than through any other single factor. Sometimes superintendents who are unable to obtain adequate budgets have become disgusted and left their jobs. When the replacement arrives, the budget is often raised significantly. This is often caused by the preparation and presentation of the budget by the new superintendent rather than because of the board's lack of confidence in the former superintendent. Thus, budget preparation is simply another important facet of the public relations efforts of the superintendent, one that can make the difference between success and failure.

Equipment depreciation and replacement is one of the more difficult sections of the budget to sell to the board. When a new piece of equipment is bought, it should be depreciated so that planned equipment replacement will always be an integral part of the club's finances. If capital equipment is depreciated at the time of purchase, then projections to replace larger capital items such as backhoes, fairway mowers, and dump trucks can be made years in advance. Unfortunately, most golf courses do not depreciate their capital equipment, and sudden breakdowns often force significant expenditures when the budget cannot really afford it. Then, other operational budget monies are often reduced or deleted to make up for the unanticipated capital expenditure.

Planned equipment replacement also reduces the significant cost of repair parts, down time, and labor needed to keep old, worn-out equipment operational for another year or two. Using

dilapidated equipment is often more expensive in the long run than buying new equipment. Clubs often spend \$12,000 to \$15,000 more a year in equipment maintenance and repair than they should. With scheduled replacement, this excess could be channeled into a separate line item capital replacement budget. A *yearly* capital expenditure item of 10 percent to 15 percent of the maintenance budget can keep equipment upgraded and save the club money over time. Again, make sure the capital budget is a separate line item and not part of the operating budget.

As mentioned above, boards and green committees are composed of businessmen who relate to business terms. Hours on a mower, for example, has no meaning to the average golfer. However, converting hours to *equivalent* mileage on automobiles allows everyone to relate to the wear on that mower. Don't try to convince the committee to approve a new mower by saying, "That greens mower is 10 years old and has almost 5,000 hours on it!" Plenty of automobiles are still in great condition after 10 years. But how many 10-year-old automobiles have an equivalent wear of 273,600 miles? That's the attention getter!

LET'S LOOK closer at the conversion factors from hours to miles on the wear of a piece of equipment to better relate to the overall life expectancy of that machine.

A car would have to travel approximately 60 miles per hour to have the same wear factor as turf equipment. Considered in this value is the high revolutions per minute, slow ground speed, and dusty operating conditions. The slow ground speed has a particularly adverse effect because the engine isn't cooled as well as an automobile traveling 60 miles per hour. This 60 miles per hour is not designed to inflate comparative numbers but simply to give a more realistic wear factor in relation to turf equipment. An automobile probably only averages 30 miles per hour when it is in operation, all driving conditions considered, but this relative wear factor would not be comparable with turf equipment operating at near full throttle and moving at a low rate of speed.

For example, a greensmower might be driven two hours a day, six days a week, 38 weeks a year, for a total of 456 hours each year. Based upon the 60-miles-per-hour figure, this mower would travel the equivalent of 27,360 miles every year. In five years it would have

traveled 136,800 miles, and in 10 years 273,600 miles. Based upon the figures, the useful life of this greensmower should be about five years; then it should be replaced or relegated to backup status.

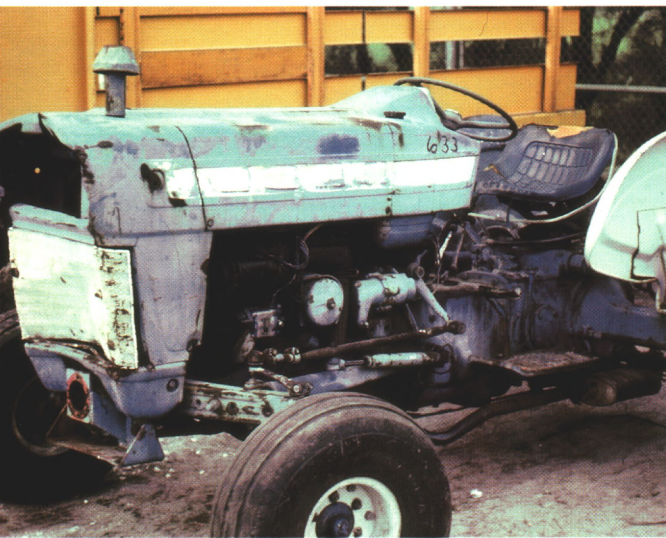
Taking a large fairway mower as another example, it might run seven hours a day, five days a week, 32 weeks a year, for a total of 1,120 hours each year. Using the 60-miles-per-hour figure, it would travel the equivalent of 67,200 miles every year, and 470,400 miles in seven years.

From these two examples, it is easy to see the impact this approach would have on the green committee compared to simply listing the number of hours each machine has been driven. Try it sometime.

Personnel management skills must receive constant attention from the superintendent, too. Just as labor expenses make up 50 percent to 70 percent of a golf course budget, it is also 60 percent to 70 percent of a golf course superintendent's job responsibility (or headache). It is often difficult to schedule the best and most efficient operation for the crew, especially when crew size and equipment availability may limit the operation.

Establishing and maintaining good crew morale is vital. Upkeep of crew





morale is difficult for many people in management positions, but more times than not, effective leadership in this responsibility can help make the difference between success and failure. It is essential to maintain full authority with the workers on your crew, while at the same time maintaining respect for them. The crew must understand that while they should feel free to discuss problems with the superintendent, it must be done on a professional basis.

*(Top, left) A clean and organized maintenance facility . . . key to efficiency.
(Top, right) A poorly maintained and cluttered barn . . . not a good impression.
(Above, left) Equipment past its useful life . . . expensive and inefficient.
(Above) Budgets are a tough sell to some board members.*

Subscribing to personnel or business management magazines or monthly newsletters can be a tremendous tool in improving the superintendent's personnel management skills, providing many helpful tips and morale boosters for keeping the crew satisfied and productive.

PERSONNEL management consultants agree that the most effective motivator for the crew comes through job appreciation. We frequently reprimand a subordinate quickly when a job is not properly carried out, but do we just as quickly praise that subordinate when a job is done well? It is certainly important to ask yourself that question as a personnel manager. One cannot expect to instill pride without praise. The hardest working and most loyal employees are those who know their work is appreciated and their efforts will be rewarded. Employee appreciation is a sign of a good manager.

The appearance and upkeep of the maintenance building and equipment are also vitally important to the overall success of a golf course management program. One of the worst impressions on the green committee or club members is to see a cluttered, junky maintenance facility — sometimes referred to affectionately as The Barn. Not all maintenance buildings can be new and modernized, but they can be kept clean and neat not only to make a favorable impression but also to keep maintenance operations efficient. Green committees are also more inclined to upgrade equipment if the present equipment and facilities are maintained impressively. A clean, well-organized shop and storage area promotes an atmosphere of proper equipment use, upkeep, and service. Boards are understandably reluctant to approve money for new equipment when existing equipment is maintained very poorly.

A run-down and cluttered maintenance facility also depresses crew morale. Everyone would agree that the crew deserves a neat, clean area in which to work, to take breaks, and to have their lunch, yet this is not the situation at many golf courses. Again, it is not the degree of modernization or the age of the building that is important; it is the cleanliness and efficiency of that maintenance facility.

Justifying labor expenses in the budget can be another tough sell to the board and the green committee. Green committees have often decided they want this or that special project done without understanding that some area will have

to be neglected in order to accomplish that particular project with the current labor force. It is important to lay out the man-hours required to do all the maintenance operations on the course. These might include green, tee, fairway, and rough mowing, bunker raking and edging, aerification, topdressing, vertical mowing, and other specialized time-consuming operations such as hazard maintenance, reconstruction, or drainage projects. In trying to justify the budget, develop a line item budget figure that reflects the time required for each of these maintenance operations in relation to man-hours available. If the green committee then decides it wants a particular operation carried out, each item is broken down into man-hours available at a particular budget level. Let the committee decide where they want to cut back in the budget to add their special projects. When each facet of the maintenance program is broken down on an hourly basis, it may become evident to the green committee that the labor force is too limited to do everything they want. Labor justification based on line item man-hour projections can be one of the best means of building a golf course budget toward proper proportions based on the wishes of the membership and the demands of the course.

ANOTHER important function that often falls on the shoulders of the golf course superintendent is the establishment and maintenance of a long-range planning outline. As mentioned earlier, the golf course superintendent is often the source of continuity for many golf courses, and his involvement with the long-range plan allows the club to continue in the same direction regardless of changes in the board or green committee.

A new green committee often initiates course improvement projects based upon the wishes of the individual committee members. When the committee is eventually replaced, the direction of golf course improvement programs usually changes, too. These projects often take the form of tree or ornamental plantings, bunker or tee changes, or possibly other physical facility upgrading around the clubhouse grounds, pool, or tennis courts. All these areas are important, but a long-range plan should be established to guide the club in the best direction and make the best use of time and resources. This is definitely an important leadership role for the golf course superintendent, one that should

help him direct the club through a series of permanent and lasting improvements on the course.

Long-range planning provides an avenue for the club to obtain its goals in the most cost-efficient manner, and should include consultations with professionals to insure the best product. Discussions with landscape and golf course architects for bunker, tee, or tree additions is very important. A Green Section agronomist can also help with long-range plan considerations or with other matters. Consultation with reputable sources should be an integral part of every long-range plan.

The last main area of managing a golf course like a business is developing good personal traits. An individual can have all the ability and knowledge in the world, but if he is not a pleasant and personable individual, then all his ability and knowledge is diminished. Personality is not something that can be taught, but it can be modified with effort. In golf course management, just as in any other business, a successful individual is pleasant to be around and has a respected way of presenting ideas and thoughts to subordinates, peers, and superiors. Proper grooming and personal appearance are major factors in the image an individual portrays. One should conduct himself and present himself in a professional manner to suit the particular occasion. For example, if the members of the board wear coat and tie to its meetings, then the superintendent should too. Personal appearance is 90 percent of first impressions, and first impressions are often lasting impressions. Therefore, presenting and conducting oneself professionally is essential to being a good manager and a good businessman. Business management consultants agree that an individual rarely achieves higher goals and advancement if he does not already appear to be at the higher level. A business executive once said, "Success is 90 percent appearance and personality, 5 percent knowledge, 4 percent respect, and 1 percent luck." Therefore, with work and perseverance one can control 99 percent of his destiny.

Make sure you are a true credit to yourself and your profession. Following through with these suggestions can help improve your image as a golf course superintendent and, in the process, produce a better businessman as well.

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FROM THE WORM'S EYE VIEW

Topdressing

by JUDITH FERGUSON GOCKEL,
Agri-Systems of Texas, Inc.

DID YOU EVER wonder what an earthworm might think about topdressing practices on our golf courses? If you haven't, then maybe it's time to take a closer look.

Topdressing for putting green maintenance is an almost universal practice; it is used to true up the putting surface and to help prevent thatch buildup. In recent years, topdressing programs have also been used to increase putting green speeds. If it is done with care and follows some simple guidelines, topdressing can also modify the basic structure of the green. This will improve water handling capacity and add to the life and health of the green and the turfgrass on it.

Topdressing practices are a major reason for the success or failure of new greens. With adequate basic construction and an informed superintendent, a new green can have a predictable life of 20 years or more. Without these fundamentals, the same green can be in serious trouble within a year.

Although topdressing is used widely, the how and why of its function are often misunderstood. We were not aware of the wide variance in practices until recently, when our laboratory developed a new technique for analyzing rates of field infiltration. The method involves using three-inch PVC pipe to take a profile of the green through the seedbed, intermediate layer, gravel, and into the subsoil beneath the green. The tube is submitted whole, tightly packed to prevent movement of the contents. After doing the infiltration test in the pipe, we cut it open to try to determine the reasons for its behavior.

In a startling number of cases, it is apparent that topdressing practices have created the problems we've found. There are cores that look like appetizing Viennese tortes, made up of many layers of differing sands and soils, and cores



New superintendents and changes in topdressing programs are reflected in this profile.

that have been dubiously blessed with every commercial topdressing of the past 15 years, one after another. We find poor greens topdressed with superb materials, and great greens smothered with the cheapest filler available. We have found we can count layers like the rings in a tree and determine when the course changed superintendents, when the budget crunch came, and the year of the big flood, blizzard, or drought. We also see greens that have been maintained to perfection, and are very successful regardless of their age. While it is possible to have problems with the best built and maintained greens, the problems are usually more manageable and involve less brinkmanship on the part of the superintendent to correct.

To understand why correct topdressing practices are so important, it is necessary to think about the growth patterns of turfgrass and to have a basic grasp of water movement in soils.

WHERE DISTINCT layers of materials exist in a profile, grass roots make little effort to grow through one layer and into the next. If the roots have as much as an inch of one material to grow in, however poor it is, they will not cross into another layer even though that layer may have optimum growth medium characteristics. We often see well-constructed seedbeds with an inch of a different but equally good topdressing. The turf can usually be peeled off like a throw rug at the interface, because the layers aren't bound together by a network of roots. Where shallow root systems exist, turfgrass is vulnerable to problems from many sources.

Not only do layers affect the root systems directly, but there is a further problem with water movement through textural barriers. To visualize this involves understanding the way a perched water table works. The perched water table, which is, incidentally, the basic principle upon which the USGA-recommended method of greens construction is based, affects all soils. Simply put, the original research demonstrated that water remains within one layer until that layer is saturated. Then it drains into the next, which again must be saturated before it can release excess water.

As layers of topdressing materials different from the basic green are built up, they create additional perched water tables and cause unpredictable consequences. Relatively small variations in soil content and particle distribution

can produce significant differences in the interaction of these materials.

Once these principles become clear, choosing appropriate materials for topdressing becomes simpler.

NEW GREENS should be topdressed initially with the same mixture of materials they were built with. Thus, in building a new green, plan during construction to set aside a supply of construction material adequate to topdress for at least two years. It is prudent to make sure the supplier will have the identical sand available in the future, and keep a supply of the organic material used in construction for an indefinite period.

After a period of time, which will vary greatly in individual cases, the roots will begin to provide enough organic material to meet their own needs for retaining water and for cushioning from the abrasion of heavy traffic. Because this is a gradual process, only by observing the root zones regularly can you know when you reach the point for a gradual cutback in the organic component. This is done best by looking at the root systems regularly. A cup cutter is a good tool to use for this examination. Go to an average area on the green and cut the deepest cup possible. Carefully extract the plug from the cut and look at the roots. In an ideal situation, the material around the roots is very similar to that below, and the roots themselves are plentiful and have a plump, healthy look. There should be no compacted area developing, nor any indication of unusual moisture retention. The topdressing program is ideal if these criteria are met.

If the top two to three inches of the core are hard and the root system scanty and weak, the organic component is very likely inadequate, and there may be an excess of silt and clay. It will be necessary to use aerification with core removal, and topdress with a clean sand of a similar type combined with about 10 percent organic material to correct this development. If the soil is becoming spongy, the organic material should be cut back gradually over several topdressings until pure sand is being used.

THE SAME technique should be used for problem analysis on older greens. It is an excellent means for determining the history of the green; an informed superintendent can often see what he is dealing with more quickly through this method than with any other single tool at his disposal.



A variety of conditions may be discovered in an older green. There may be layering from multiple topdressings. This condition can be relieved to some extent by aerifying several times, removing cores, and topdressing each time with a clean sand in the medium to fine size range. This technique will be helpful if the layer is less than three inches deep.

Problems may appear in the form of a spongy upper layer, perhaps resulting from on-site mixing during construction, which has left excessive quantities of organic material in the upper portion of the green. This is more difficult to correct, although the same basic technique may be tried. It is sometimes necessary to remove the sod and remix the seedbed before real gains can be made.

The upper layer may be hard and compacted, indicating an excess of silt and clay in the topdressing material, often in combination with very fine sand. Here again a very clean medium to fine sand may be employed in conjunction with aerification. It can be helpful to add up to 10 percent peatmoss in this instance.

Beyond the top three inches or so, it is almost impossible to make significant changes in the green's behavior using topdressing modifications. New technologies developing in some areas may make it possible to modify most of the seedbed. Time and experience will give



(Far left and left) The fact that water does not readily move from a silty loam into a layer of sand may help to explain why this green has drainage problems. It has been top-dressed with a material that contains more silt than the original construction topmix.

(Below) The profile of a green, using 3-inch PVC pipe, shows how the green was built and gives a history of its maintenance.

TABLE 1
Characteristics of Soil Separates

Name	Diameter*	No. of Particles per Gram
Very coarse sand	2.00-1.00 mm	90
Coarse sand	1.00-0.50 mm	722
Medium sand	0.50-0.25 mm	5,777
Fine sand	0.25-0.10 mm	46,213
Very fine sand	0.10-0.05 mm	722,074
Silt	0.05-0.002 mm	5,776,674
Clay	below 0.002 mm	90,260,853,860

*As established by the USDA



us a better idea of their long-term effectiveness.

A CURRENT trend, which has caused many problems, is the building up of a sand layer on top of greens that are basically soil in order to improve putting speed. While it is possible to modify the greens in this manner, it should be done gradually over a couple of years rather than in an abrupt changeover. The modifying sand should be selected and mixed into the existing topdressing in a ratio of about 25 percent of volume. This material should be used several times and then further divided into a 50-50 proportion for several more topdress-

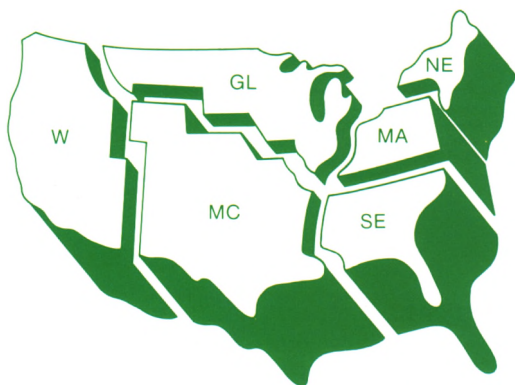
ings. Continue increasing the quantity of sand in the topdressing until roughly a two-inch transition layer has been built up. This slower procedure usually allows the soil and sand to blend well enough for water to be moved as if there were no change. The infiltration rate will be that of the soil portion of the green, of course. Regular aerification should be done throughout the transition period, and cores should be removed each time.

If the original material of which a good green is built becomes unavailable for topdressing purposes, it is crucial to locate the closest possible substitute. This can be done by taking the particle

analysis of the original sand to area sand suppliers to seek a match. Fortunately, similar sands are often available from the same area. Locating a close substitute will allow a continuing successful topdressing program.

Regular examinations of the seedbed using this core sampling technique are helpful in becoming aware of problems before they develop into serious conditions. Success or failure often takes place on the worm's eye level.

Topdressing is more than a filler. It plays an active part in keeping good greens good, golfers happy, costs down, and aggravations to a manageable level. These are goals well worth pursuing.



1986: The Season in Review

Each golfing season challenges the golf course superintendent with another set of surprises, crises and problems to attend to. The Green Section staff has spent the year visiting more than 1,000 golf courses in all parts of the country, and has highlighted the season in the following pages.

The #1 concern in 1986? You guessed it . . . **Water Problems!**



Mid-Atlantic Region

by **STANLEY J. ZONTEK**, Director,
and **PATRICK M. O'BRIEN**, Agronomist

FOR MOST golf courses, 1986 started out very well. In the early spring, the only complaints from most superintendents in the southern part of our region was the extremely slow early growth of the putting green bentgrasses. We had only a few problems with winterkill, and these were in the higher elevations of southern Ohio and parts of Kentucky.

The spring rains never arrived in the Mid-Atlantic Region, and irrigation systems were turned on earlier than normal. Unfortunately the drought continued through July in many areas, and a number of golf courses nearly ran out of water. Normal rainfall was oftentimes behind by 10 to 18 inches, with a few areas receiving no significant precipitation for over 100 days. Although not as widespread as last year, water restrictions were implemented in some localities.

A number of turfgrass diseases were very active on putting greens this season. One of the most prevalent was Summer Patch, or *Poa annua* Patch, caused by the organism *Phialophora graminicola* or *Leptosphaeria korrae*. There is still some debate on which organism causes the problem, but there seems little debate on which treatments control this disease. Good control centers around applying Bayleton at four ounces per 1,000 square feet or Tersan 1991 at eight ounces per 1,000 square feet. If one of these treatments does not adequately control the disease, try the other.

Pythium was very active as well, perhaps the most seen in years. The accompanying picture illustrates a hopefully isolated extreme. Warm, wet summer weather with high day temperatures and warm, humid night temperatures was perfect for *Pythium* development. This destructive disease is usually effectively and relatively economically controlled with a number of good fungicides. Unfortunately, a resistance problem apparently developed and turf was lost before an alternative fungicide could be applied. To make matters more interesting, there was also some indication that the disease pictured is an especially virulent race of *Pythium* which became active in isolated areas of Kentucky, Ohio, and Pennsylvania this summer.

Several management practices became popular on greens. For isolated dry spots on putting greens, solid-tine spiking worked well. Most superintendents used the tapered tips rather than blunted ones to reduce the compacting forces when the greens were punched. Please note that we are not recommending the regular use of solid-tine spiking as a substitute for traditional hollow-tine aeration. However, the use of solid tines can be useful for specific problems like isolated dry spots and when the root zone becomes saturated in the summer due to excess water. It is another tool that can be used when it's needed.

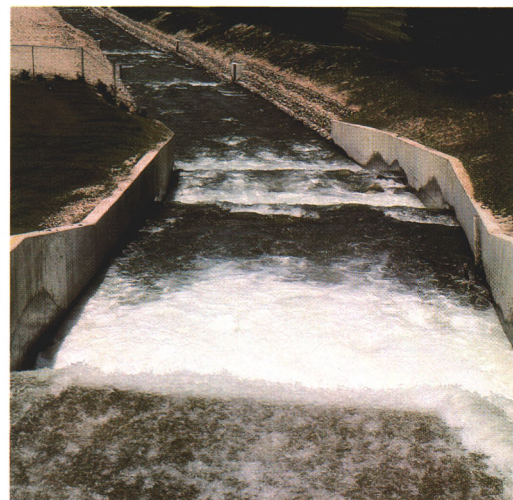
Other successful programs included the application of light rates of fertilizer during the summer on perennial ryegrass

fairways to maintain better turf density. Prograss applications in the fall to control *Poa annua* in perennial ryegrass fairways is also being used to good advantage on an increasing number of golf courses in the region. Combined with good mowing, pest control and overseeding programs, some excellent ryegrass fairways are being produced for golfers in this part of the country.

The year in review for the Mid-Atlantic Region can be described as a year of extremes — too dry, then too wet, too hot and too humid. These extremes caused problems and presented a challenge to the golf course superintendents in this region this year. No one knows what the future holds for 1987, but there will no doubt be a few new challenges out there.

(Below) Water is the issue!

(Opposite page, bottom, left) Build it right . . . the first time!





Northeast Region

by JAMES T. SNOW, Director,
and GARY A. WATSCHKE, Agronomist

EACH YEAR sees its share of trends and troubles, and 1986 was no exception. Though weather conditions from week to week are always of concern to golf course superintendents, weather problems were generally unexceptional in the Northeast. Nevertheless, short-term weather extremes, including heavy rainfall, heat, and humidity, contributed to the severity of the problems.

Perhaps foremost among the troubles was the widespread occurrence of *Phialophora graminicola*, or Summer Patch disease, a potentially serious disease of *Poa annua*. After a period of heavy rainfall followed by high heat and humidity

in late July, at least two out of three golf courses visited in parts of the Northeast were afflicted with the symptomatic yellowish rings and patches of this and closely related diseases. Noted primarily on greens, Summer Patch was diagnosed on fairways as well, and in many instances the loss of turf was significant. Recommended control measures involve reducing stress factors as much as possible by way of extra aerification, improved irrigation practices, raising cutting heights, tree thinning, tree root pruning, nematode testing, adjusting fungicide spray programs, etc. Not surprisingly, Summer Patch was most common and most severe at golf courses that keep

their greens under constant stress in order to maintain consistently fast putting surfaces. With moss, algae and difficult-to-control diseases becoming much more prevalent, are our greens trying to tell us something?

IN THE WAY of trends, golf courses are continuing to set higher standards for fairway maintenance. The switch to lightweight mowers at all budget levels continues, and the number of courses using triplex mowers and clipping removal is increasing steadily. Fairway cultivation is being stepped up, with modern, efficient aerifiers and verticutters being purchased to follow through with these important programs. The use of plant growth regulators (PGRs) such as Embark, Cutless, and Scotts TGR is increasing, offering potential as a tool to suppress *Poa annua* and encourage the spread of bentgrass. With the advent



(Left) No water . . . no turf! (Below) Summer patch disease was widespread throughout the Northeast and Mid-Atlantic regions. (Bottom, right) Who says they have never seen Pythium run!



of lightweight fairway mowing and the use of PGRs, bentgrass is spreading dramatically in fairways, and there appears to be more of a shift to bentgrass overseeding and away from perennial ryegrass.

More attention is also being afforded the roughs. *Poa*/bent rough areas are being seeded or sodded to Kentucky

bluegrass and/or perennial ryegrass to improve their appearance and playability. In addition, more liming, fertilizing, and aerifying is being done to improve turf density in the roughs, especially in areas that suffer through heavy cart use. Finally, more and more courses are raising cutting heights in the roughs, maintaining a four- to eight-foot inter-

mediate cut, and using rotary mowers for the roughs. Rotary mowers are more maneuverable and produce a truer cut by lifting the turf as they cut.

Winter in the Northeast gives the superintendent the opportunity to reflect on last season's successes and failures, and plan for the inevitable problems and challenges of the year ahead.



Great Lakes Region

by JAMES M. LATHAM, JR., Director

WATER WAS a prime problem throughout much of the Great Lakes Region in 1986. Saturated soils left over from November, a January thaw followed by intense cold and then a period of freeze-and-thaw cycles caused a great deal of loss of annual bluegrass and perennial ryegrass turf. Survival was enhanced by rapid surface drainage and snow cover or other protection against varying temperatures at the soil surface.

The value of good drainage was reiterated in July, when a prolonged period of rain was followed by high day and night temperatures. Roots in the saturated soil and thatch were denied oxygen, and most of them died. Plant tissue became so weakened that some turf on closely mown greens was killed by simply using a squeegee to remove surface water. Foot traffic around the holes during this period was equally

lethal. Some diseases became epidemic, perhaps because the plants were in such poor physical condition that systemic fungicides could not be adequately translocated through the tissue.

Many northern courses concentrated on increasing the non-*Poa annua* population of fairways and roughs. The color and texture contrasts between contoured bentgrass fairways and bluegrass roughs is spectacular.

The high point of the season for some was the recognition that new, high-sand greens do not have to be hard, pale, thin or dry. The key is finding a *good quality sand*, combining it with an acceptable additive and then fitting the mixture with the other components necessary for good drainage.

The low point of the year was the continuing evidence that too few golf course architects give any consideration to green construction fundamentals,

thus leaving the high costs of correcting mistakes to the owners.

THE MOST encouraging observation of the year is the number of courses committed to thatch management on fairways. If lightweight mowing is to be practiced, something has to be done to keep thatch to a manageable level so that roots can become established in the soil and shots can be played from firm surfaces.

Great Lakes Region Summary — 1986:

1. a. Perennial, as in ryegrass, is a misnomer. b. Annual, as in bluegrass, is not.
2. Systemic fungicides do not function very well when the root systems of plants to which they are applied are not functioning well.
3. It is never too late to install drainage on a golf course. Some have waited 70 years to do it.
4. Pure, medium sand (0.25mm to 0.50mm) makes great topdressing; it is the key component to green construction topmixes.
5. Peats should always be as thoroughly tested as sand.
6. When the heat's on, slow green is always better than fast brown.



Western Region

by LARRY W. GILHULY, Director

ITHINK WE ALL agree that the primary issue regarding golf course maintenance is the most plentiful compound found on this earth — water. While the Southeastern portions of the country suffered through record drought conditions, the western United States has, by and large, had too much water. Someone once stated that the single

most important aspect of golf course maintenance involved good drainage. In the case of the water dumped on northern California in the early portions of 1986, the best drainage in the world would not have been enough. Record-setting amounts of rain caused massive flooding in northern California, and in some cases golf courses were covered with

water for weeks until the excess water drained off naturally. At Peach Tree Golf & Country Club, in Marysville, California, several holes and the entire maintenance facility were under water. A dike broke approximately one mile below the course and saved the course from massive flooding problems, but some areas were under water for several weeks. It became so bad that the City of Sacramento came within hours of evacuating major portions of its population.

On the flip side of excess water situations, there is the continuing concern with water shortages in the southwestern portions of the western United States. In Arizona, mandatory water allotments



(Left) Scenery and safety go hand in hand. Tiered tees and a guard-railed golf-car roadway enhance this par-3 hole.
(Below) Is this a look at the future or the past?



for golf courses begin on January 1. At that time Arizona will start water allocation at a rate of five acre-feet per year for all golf courses. It is currently the only state with this kind of water law, and other areas will be closely watching this situation. Thus far, clubs have had little or no problem staying at or under their water allotment. With less water being applied, the courses have also shown improvement from an agronomic and playing standpoint.

IN SOUTHERN California, water quality continues to be a problem for those superintendents maintaining greens

that are comprised of bentgrass and high *Poa annua* populations. As the salts in the soils continue to increase, many superintendents are finally getting through to their memberships that growing grass under poor soil situations simply cannot be done without good drainage. The rebuilding of older soil-base, non-subsurface drained greens continues in southern California and other areas plagued with this problem.

In addition to flooding problems in northern California, the excessive amount of moisture resulted in a heavy snow pack in Utah. As a result, the Great Salt Lake has risen above its

banks and is not only threatening several golf courses but the airport as well. It is unfortunate that all of this excess water couldn't be funneled elsewhere.

Other than the problems with water, the year has been rather uneventful for most superintendents in the western United States. Some superintendents have had problems with disease, while superintendents in Portland, Oregon, and Los Angeles have had their first turf loss from nematodes. Other than these isolated cases, the superintendents in the western United States continue to produce quality playing conditions.



Southeastern Region

by **CHARLES B. WHITE**, Director,
and **JOHN H. FOY**, Agronomist

WITH THE exception of Florida, this year was extremely difficult in the Southeast because of severe heat and drought. They took a toll on many golf courses due to the combination of lack of water, poor irrigation systems, and in some cases mistakes in management going into or during the drought period.

The spring and summer proved to be an educational experience for many superintendents, who found out that if they are managed properly, turfgrasses are actually quite drought and heat tolerant — including bentgrass. Bentgrass was often watered on a two-day irrigation cycle throughout the summer and supplemented with the hand water-

ing of drier areas. These practices helped to maintain good soil aeration and good rooting vigor and depth through the summer, a real feat considering that soil temperatures were as high as 85 degrees for much of the summer. In some cases there was actually new root initiation in June from bentgrass in the Piedmont Southeast following an aerification with small tines and an application of potassium sulfate. This is certainly a credit to good management by superintendents who understand the relationship of low nitrogen and high potash fertility programs.

Among the golf courses that best survived the summer drought and heat were those that had basically a 1:1 ratio

of nitrogen to potash, coupled with proper and strategic water regimes. This year many learned that small quantities of water can sustain turfgrass health and playing conditions far better than larger volumes.

DESPITE THE heat and drought this summer, one of the most important factors determining bentgrass success was air circulation. The accompanying picture shows a well-built green with very poor turf in the center when all other greens on the course were in excellent condition. The difference? No air movement due to surrounding banks and undergrowth. Poor air circulation is truly one of the greatest enemies in the turf management business, along with excessive heat, humidity, and drought.

Generally speaking, I thought that golf course superintendents coped extremely well with the drought. Many superintendents did an excellent job of

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

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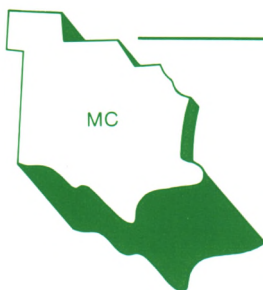
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I certify that the statements made by me are correct and complete.

Robert Sommers, Managing Editor

rationing water when availability became minimal, and adjusted to the limited water supply by instituting such programs as increased potash applications, raising cutting heights slightly, and reducing frequencies of cut.

A side benefit of the drought was increased awareness of the importance of proper irrigation and water supply. In many cases, boards approved funds for upgrading irrigation systems and water supply sources. Unfortunately, it often takes such extremes to obtain capital improvement funds for golf courses, but at least for some, there was a silver lining inside their dark cloud.



Mid-Continent Region

by JAMES F. MOORE, Director

TURF MANAGERS in the Mid-Continent Region would like to forget 1986. Difficult may be the best word to describe the season, although others would choose harsher adjectives.

Although the causes of the difficulties varied widely, a common foe was the very early play on dormant or nearly dormant turf. Most clubs experienced between 8,000 and 12,000 rounds of golf above their yearly average. Although the increased revenue was welcome, the extra traffic amplified limitations such as poor greens construction, improperly sized or heavily shaded tees, and fairway soils that quickly compacted with the additional cart usage. Weakened turf became more disease susceptible, and as the summer progressed, many courses lost large amounts of turf.

ANUMBER of trends (some good and some not so good) in turf maintenance were noticed across the 10 states that make up this region.

Aerification — Everyone seems to be climbing on the bandwagon, and courses are responding with better turf and improved playing conditions.

Fertilization — Although lower phosphorous levels discourage *Poa annua*, some are carrying this reduction to an extreme, resulting in severely weakened turf.

Chemicals — Many excellent new chemicals are available. Unfortunately, a tremendous amount of experimenting

On the other hand, southern Florida was inundated with rain this summer. One course in southwestern Florida reported 15 inches in 21 days, while most of the Southeast fell 12 to 15 inches behind in rainfall this year. Courses that were well drained had a relatively good summer. Poorly drained courses had a significant amount of disease and other problems associated with saturated soils.

The southeastern United States had weather extremes in 1986 that challenged the golf course superintendent to use all his skills, and each one became a better manager in the process.

is going on — on the greens. Good superintendents should experiment, but on the nursery or practice green.

Construction — Too many clubs were trying to provide championship putting quality every day on greens whose construction more closely met the specifications of the highway department than those of the Green Section. Poorly constructed greens must be maintained to less demanding standards (especially when it comes to speed) than a green that is built properly. Many clubs are also building new greens and, unfortunately, yielding to the temptation to cut corners to save a few dollars. It is part of the superintendent's responsibility to protect the interests of his club by insisting on proper construction techniques.

Wetting Agents — It's too bad these products don't deliver all the promises made for them. Although they can be helpful to a limited degree, they cannot substitute for good construction and good cultivation practices. When applied heavily and followed by high temperatures, problems can sometimes result.

The year 1987 will no doubt offer its own challenges to turf managers in the Mid-Continent Region. You should be realistic about what can be produced, given the set of circumstances (budget, construction, climate, etc.) present at your club. It is our goal as USGA Agronomists to help you achieve the most from your course within the bounds of solid agronomics.



FOR GREEN COMMITTEE CHAIRMEN, SUPERINTENDENTS, CLUB OFFICIALS:

The Green Section 1987 Educational Program

Monday, February 2, 1987, Phoenix, Arizona

One Business Where Success is Not Always Found at the Bottom Line

- | | |
|---------------|--|
| 8:00 - 8:10 | Welcome and Introductions
<i>Marion B. Farmer, USGA Executive Committee and Green Section Chairman, Los Angeles, California</i> |
| 8:10 - 8:30 | The Best Turf Tips of 1986 — Part I
Last year's successful feature "Turf Tips" is back by popular request. Here is the Green Section Staff at its best, with an all-new 1986 edition; Part I.
<i>Gary A. Watschke, Northeast Agronomist, Far Hills, New Jersey</i>
<i>Larry W. Gilhuly, Western Director, Tustin, California</i>
<i>John H. Foy, Southeast Agronomist, Jupiter, Florida</i> |
| 8:30 - 9:00 | Basic Opinions — But Not Necessarily Those of Today's Management
How can "The Basics" become controversial? Hear these three editorials and decide for yourself!
"So You Think You Understand Automatic Irrigation"
<i>Clifford A. Wagoner, Past President GCSAA, Modesto, California</i>
"The Golf Course Superintendent and the Environmentalist; Friend or Foe?"
<i>Monroe S. Miller, Superintendent, Blackhawk Country Club, Wisconsin</i>
"The Forgotten Magic of Lime"
<i>Wm. H. Bengeyfield, National Director, USGA Green Section, Tustin, California</i> |
| 9:00 - 9:25 | Some Funny Things Found in Golf Bags
As in life, someone is always looking for an advantage in golf. The Past Chairman of the USGA Implements and Ball Committee reports on everything from putters to woods, grips to gloves.
<i>M. T. Johnson, USGA Executive Committee, Amarillo, Texas</i> |
| 9:25 - 9:50 | Biotechnology and Turfgrass Research
Many believe biotechnology has already dramatically changed agriculture research. What will it do for us in improving the grasses of golf?
<i>Dr. Cyrus McKell, Vice President and Director of Research, Native Plants Institute, Salt Lake City, Utah</i> |
| 9:50 - 10:00 | Break |
| 10:00 - 10:20 | The Best Turf Tips of 1986 — Part II
<i>James T. Snow, Northeast Director, Far Hills, New Jersey</i>
<i>Charles "Bud" White, Southeast Director, Athens, Georgia</i>
<i>Stanley J. Zontek, Mid-Atlantic Director, West Chester, Pennsylvania</i> |
| 10:20 - 10:40 | For the Golf Course Superintendent; There's a Time to Hold — And a Time to Fold
In 60 years of GCSAA, the golf course superintendent has come from laborer to professional. But let's be sure we keep the proper perspective.
<i>Riley L. Stottern, President, GCSAA, CGCS, Jeremy Ranch Country Club, Utah</i> |
| 10:40 - 11:00 | The Trials and Tribulations of a Green Committee Chairman
The membership of most private golf clubs is made up of very successful and very individualistic people. Being their green chairman has its serious as well as humorous moments.
<i>Howard Keel, Green Committee Chairman, Bel Air Golf Club, Los Angeles, California</i> |
| 11:00 - 11:20 | A Few Minutes with Frank Hannigan
Some thought-provoking and considered views on The Game and course maintenance by the Senior Executive Director of the USGA. |
| 11:20 - 11:40 | The Best Turf Tips of 1986 — Part III
<i>James F. Moore, Mid-Continent Director, Waco, Texas</i>
<i>Patrick M. O'Brien, Mid-Atlantic Agronomist, Richmond, Virginia</i>
<i>James M. Latham, Great Lakes Regional Director, Brown Deer, Wisconsin</i> |
| 11:40 | Closing Remarks
<i>Marion B. Farmer, Chairman, USGA Green Section Committee</i> |

TURF TWISTERS

ON THE JOB

Question: I am the new green committee chairman at my club, but I am unfamiliar with the responsibilities of my new job. Do you have any information that might be of help? (New York)

Answer: Among the literature available from the USGA is the booklet "A Guide for Green Committee Members," which should help introduce you to your new duties and to your working relationship with your golf course superintendent. For copies of this and other reprints, simply write to the USGA Green Section, Golf House, Far Hills, NJ 07931. Phone (201) 234-2300.

TO KEEP BUGS IN CHECK

Question: Because it is more convenient, we have been applying insecticides for control of mole crickets during the early morning hours, before play begins on the course. I have been told that we could obtain better results if the insecticide was applied in late afternoon. Why is this? (Florida)

Answer: Mole crickets are nocturnal feeders and are closest to the soil surface during the evening. Spraying in late afternoon places the insecticide in close proximity to the mole crickets at the most opportune time to achieve good control. While late afternoon spraying may be inconvenient, the increase in efficiency makes it well worth the effort.

AND CARTS ON THE PATHS

Question: Cart path renovation and installation is about to begin at our golf course. How wide should paths be for greatest usefulness? (North Carolina)

Answer: Paved cart paths should be constructed seven to eight feet wide if at all possible. This width will accommodate golf course maintenance equipment, which must also have an avenue around the course. The additional width is an excellent investment, and the eight-foot width does not have to look like a highway, as some might feel. As with any cart path, the location and routing of the path is the key to its appearance.