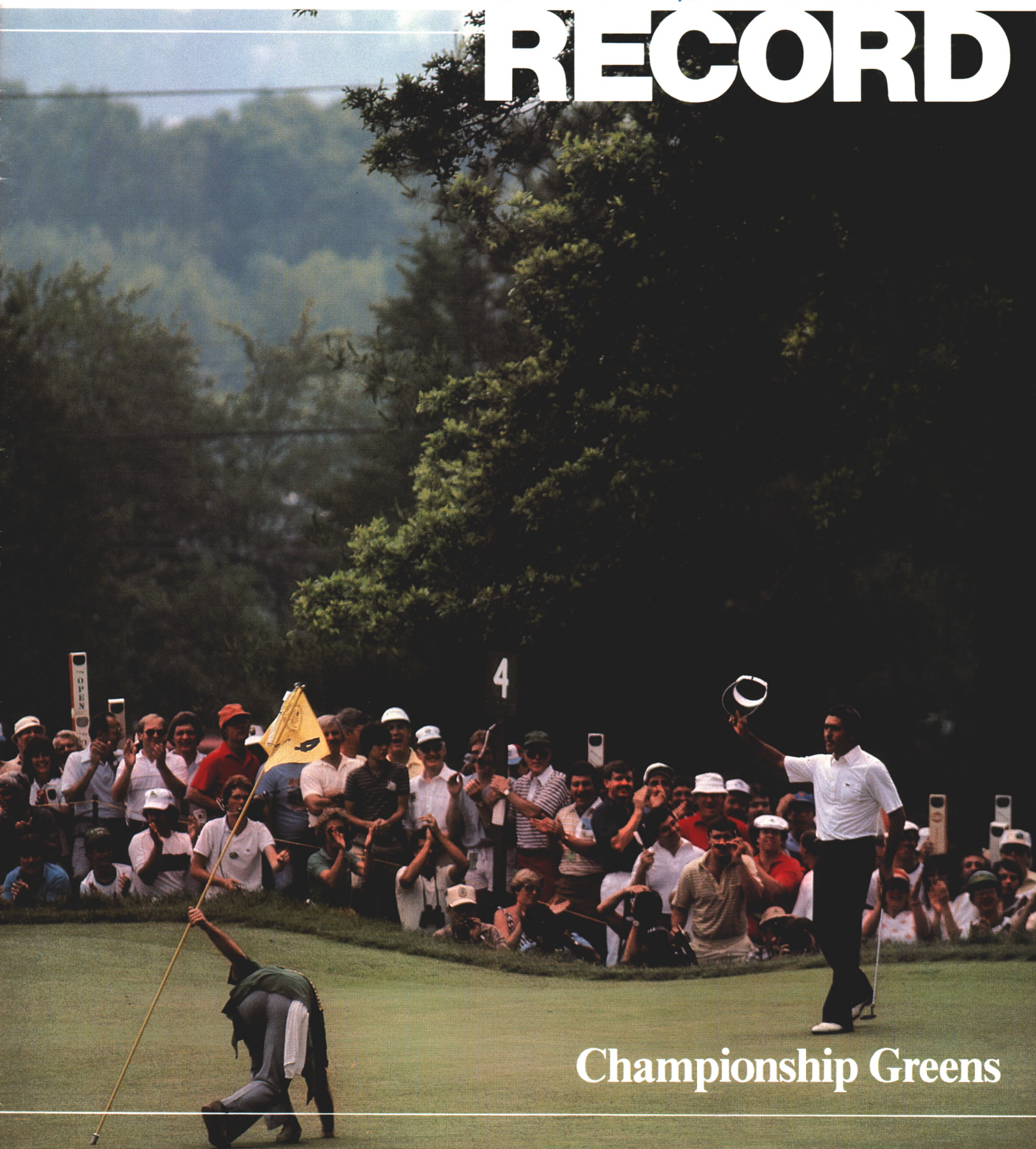


USGA®

Green Section RECORD



Championship Greens

USGA®



Green Section RECORD

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Cover Photo:

*Championship greens roll
smooth and true from the
first putt to the last.*

Photograph by JOHN KELLY

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The Secrets of Championship Greens Revealed

by DR. DOUGLAS T. HAWES

THE NEXT TIME you hear of “spoon-feeding greens,” you may want to check the size of the spoon. It may account for only a quarter-pound of nitrogen per 1,000 square feet, or it may be no more than one ounce of nitrogen per 1,000 square feet! There are all sorts of low nitrogen fertilization programs for putting greens these days — from a sniff to a snifter. How good are they and what do they offer?

Increasing numbers of golf course superintendents today avoid feeding greens at all from late June to early September. For years the Green Section has advocated less nitrogen on greens, although we have not been very specific about actual rates. When he was Eastern Director of the Green Section, Alex-

ander M. Radko wrote an excellent article on the subject, “Why the Nitrogen Race?” He noted that, “Better putting surfaces are a reality when the turf is on the lean and hungry side. They putt smoother and faster, and they are more nearly true, less likely to become severely infested with *Poa annua*, less subject to wilt, and they do not build up heavy mat or thatch so rapidly.”

Obviously the encouragement of lower nitrogen rates for bentgrass greens has succeeded. Some are now even saying the rates have gone too low; they may be right in some cases. I have seen a few awfully thin greens caused by under-fertilization. Serious putting green losses that developed on some courses in recent years were caused by several earlier

seasons of under fertilization, according to Bill Bengeyfield, National Director of the Green Section. This condition of weak turf and poor growth resulted from slow depletion of organic or slow release nitrogen sources within certain putting green soils. Older greens can often coast for a year or two on this type of accumulated nitrogen, but they cannot go on forever. Sooner or later, a return to sensible nutritional practices will be essential.

Many factors determine what it takes to produce championship putting greens, therefore, it is difficult to establish hard and fast rules. Nitrogen applications do appear to be one of them, however. Years of experience have indicated that a half-pound of nitrogen per 1,000 square

The scale can tip both ways — some greens are too thin; some too fat.



feet per month of growing season may be a better, more healthy application rate than the past standard of one pound per month. Of course, some golf courses with championship putting conditions follow a higher nitrogen program. And yes, you must consider many factors before making a decision for your own golf course, factors such as:

- The nitrogen source
- The soil mix of the greens
- Age of the greens
- Size of the greens
- Amount of play
- Amount of nitrogen applied per application
- Soil pH
- Other nutrient levels
- Type of grass
- Time of year
- Rainfall - water quality
- Salinity level
- Temperatures.

All play an important role, and yet the majority of golf courses today tend toward the use of a half-pound of nitrogen or less per 1,000 square feet for each month of the growing season.

Another trick gaining in popularity (and effectiveness) is the use of two

ounces of ferrous iron sulfate in no more than five gallons of water per 1,000 square feet (do not water in). This will improve color during mid-summer. It is far safer than trying to improve mid-summer color with more nitrogen and more water. We have all known disasters resulting from this practice in late July and August.

Each golf course superintendent must examine the factors affecting the nitrogen need of his greens. No fertilizer salesman, vendor, or consultant should make this judgement. The superintendent alone must make the final determination and then set his plans for a total management program.

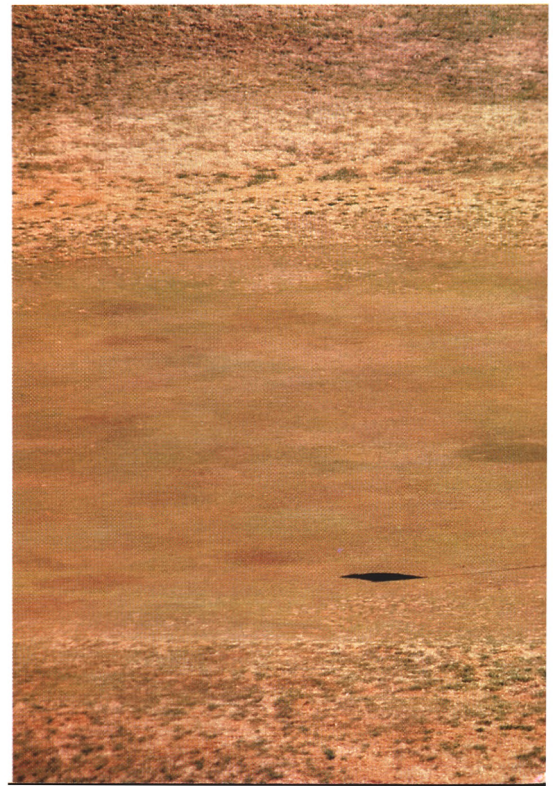
The decision regarding fertilization practices depends upon the growth rate of the grass. Growth rates greatly influence putting green speeds. Dormant winter greens will gain speed under dry weather and wear, while the flush of spring growth will slow greens down. During the summer, growth slows again and speed picks up. Greens can undergo a tremendous variation in putting green speed through the seasons while remaining at the same height of cut. The Stimp-meter can be a sensitive tool in determining growth rates.



(Above) An iron application improved the color of this green without the need of additional nitrogen.

(Top, right) Grass blades on a high nitrogen diet tend to be wide-bladed, dark green and tender.

(Right) Old bentgrass greens develop patches of fine-textured, well-adapted strains. These show up clearly in the late fall and early spring as greens are on the hungry side.





One must be extremely careful applying these materials. Applications above a quarter-pound available nitrogen per 1,000 square feet may cause a flush of growth which will, on championship greens, slow down Stimpmeter speeds dramatically. During heat stress, rates above a quarter-pound cause creeping bentgrass to come under additional stress due to stimulated top growth at the expense of root growth. Roots die more quickly on cool season grasses when they are fed with large amounts of nitrogen during the summer.

Methyl ureas, natural organics and coated fertilizers have somewhat less readily available nitrogen. We find that a quarter to a half-pound nitrogen from one of these sources produces a similar type of response in the grass plant as a quarter-pound of the soluble materials.

The most slowly available nitrogen sources are urea formaldehyde and IBDU. These materials are generally recommended for application at much higher rates than the others because not all of their nitrogen is immediately available. However, some of it is available in water-soluble form, and a quick initial response, depending on how much is initially applied, is possible. To some extent, the release rate of urea formaldehyde, methyl urea and natural organics is temperature dependent. Microorganisms break them down to nitrogen forms usable by plants. Assuming moisture conditions are adequate and the temperature rises, microbial activity increases. Therefore, as hot weather develops and bentgrass growth and the plant's need for nitrogen decreases, the slow release materials continue to make nitrogen available.

IBDU and coated nitrogen materials become soluble and are made available by the amount of water applied to the surface with very little temperature effect. Thus, when we are dealing with this slowly available material, it is a little more difficult to predict how it will behave. Particle size also affects the response of all slow-release materials. Some commercial fertilizers may include several nitrogen sources. The manufacturer is probably trying to provide a product that will give quick greenup response yet offer long-term nitrogen release as well. The response seen from different commercial fertilizers will vary from product to product, and, it will also vary depending on the time of the year used. Because of the difficulty in knowing how a slow release fertilizer may respond to relatively unpredictable weather conditions, many



Of course, growth rates are directly influenced by nitrogen levels. A pound of nitrogen applied in the spring will slow greens down by six to 12 inches on the Stimpmeter. A hard frost in the late fall may speed them up by the same amount. This can be serious in the late fall if greens are already fast. They may go into the winter very slick. With no further growth, they will stay that way or become even faster until spring.

Nitrogen Sources

Basically we should consider three, maybe four types of nitrogen sources. The first are the soluble nitrogen fertilizers, such as urea, ammonium nitrate, ammonium sulfate, and liquid fertilizers.

superintendents are breaking away from their use on greens. They want better control of nitrogen levels and grass response. They obtain it by putting nitrogen on in very small dosages of readily available (soluble) nitrogen. This is sometimes referred to as "spoon-feeding" the turf. In natural situations, grass is toughest when only very small amounts of nitrogen are available. High rates of nitrogen result in quick healing but lush growth. A lush, fast-growing grass plant is a tender one easily damaged by traffic and disease. Therefore, we gain speed of recovery with high nitrogen rates, but we lose a lot of the grass plant's tolerance of wear and stress.

It has been said that high quality championship putting greens are found only at high-budgeted clubs. This is not true. Some of the finest quality greens can be found on relatively low-budget courses. It is not so strange, however, that this may be for only a very limited period, because that superintendent frequently moves on to a high-budgeted club. The quality greens "move" with him.

There is a certain philosophy regarding the use of fertilizers for putting greens and how it relates to their quality and cost. I think it is true for all golf courses. If you develop a correct and proper nitrogen program for your greens and the results are successful and satisfactory to you, then the cost of the fertilizer is inconsequential. If Brand X is helping you consistently produce championship greens, use it! The particular product is a negligible expense toward maintaining the golf course. Let me add, however, that I do not imply that the most expensive fertilizers will produce the best greens. Rather, the best greens are produced by the fertilizer best suited to your talents and your golf course.

What About Potassium?

More and more we seem to be realizing that high quality putting greens require as much potassium as they do nitrogen. This is especially true on new greens built to USGA Green Section specifications, and even more so on the so-called straight-sand greens. Those applying equal or

more potassium than nitrogen have less need for syringing, and the greens stand up better to traffic. At high potassium levels, the grass is less prone to wilting, more disease resistant, has a better root system, is more traffic tolerant, and has stiffer blades. It is important to remember that available forms of soil potassium are almost as mobile and leachable as soluble nitrogen.

Other Factors

Maintaining championship greens daily requires more than just a good fertilizer program. Firm, smooth greens at 8½-foot Stimpmeter speeds and free of grain require daily maintenance. They are mowed every day at 3/16-inch or less, verticut or brushed lightly at least once a week. Usually they are lightly topdressed monthly during the growing season. Topdressing usually seems closely associated with faster putting speeds. It aids in obtaining a firmness of surface. It makes it easier to reduce grain, because by brushing in the topdressing, the grass blades are forced to stand up. It is not necessary to topdress to have championship greens; it just seems to make it easier.

It is the superintendent and his crew; they produce championship putting surfaces. Clubs known for consistently having championship putting greens, regardless of the superintendent in charge, have probably been very careful when hiring their superintendents. They also have greens with enough surface area to handle traffic adequately. These clubs also have greens with good surface and internal drainage.

Championship greens should be fast, uniformly paced, firm but resilient. Close daily mowing, a light nutrient program, minimal amounts of water, a good topdressing schedule, and grain control are the accepted means of achieving such surfaces. Championship conditions are not possible where greens are small in relation to volume of play. Where there is poor surface and internal drainage, the outlook is bleak indeed.

Now that the secrets are out, you, too, can provide putting conditions your members will boast about. It is not easy to do, but carrying out the proper program day in and day out can lead to great rewards for your course and yourself. The rules to remember:

1. Avoid early spring fertilization on bentgrass greens.
2. Apply no more than a half-pound nitrogen per month of growing season.
3. Keep potassium levels up.
4. Groom, groom, groom.

Green Section agronomists try to help clubs build championship putting greens.





Dr. Ralph Engel (right) of Rutgers University, and Joe Spang, superintendent at the Rutgers Golf Course, observing results with the Stimp meter.

Some (More) Thoughts on Putting Green Speed

by **DR. RALPH E. ENGEL**

Research Professor, Rutgers University, New Jersey

Editor's Note: *There have been several articles on the Stimp meter and putting green speeds in recent issues of the RECORD. Here is another well worth reading. It expresses some interesting views not earlier presented.*

THE SPEED OF putting greens is never settled to the satisfaction of the great assortment of golfers. Commonly, professionals and low handicap players request fast greens, and some high handicap players accept them as the style. Moderately fast greens are usually popular, but a few golfers prefer slow greens.

The demand for fast greens has increased greatly in recent years. Some of this change is due to the Stimp meter, which is an inexpensive, simple, and quick tool. This device has become a standard measure, and it has led to frequent com-

parison of green speed on individual courses and between courses.

If anyone asks if greens on today's golf courses are faster than in recent years, the answer is yes. Twenty to twenty-five years ago, the mowing height was typically 1/4-inch. Presently, a majority of courses set their mowers at 3/16-inch or closer. In addition to this change, thinner bed-knives make 3/16-inch a closer cut than formerly. Along with these changes, double or triple mowing is practiced occasionally.

How do golfers react to speedier greens? Personally, I find moderately fast greens add interest to the game. A true roll with a gentle touch is a pleasure. There are those who say very fast greens put too much emphasis on putting. It becomes a question of what is too fast. Possibly greens are too fast when good putters develop anxiety over this phase

of the game. When a putt falls out of its arc on a mild slope and increases speed in another direction, putting is scarcely fun. The USGA classification of green speeds by the Stimp meter is considered good and seems realistic to me. The following table shows what the USGA considers reasonable for different types of courses.

USGA Green Speed Test Comparison Table

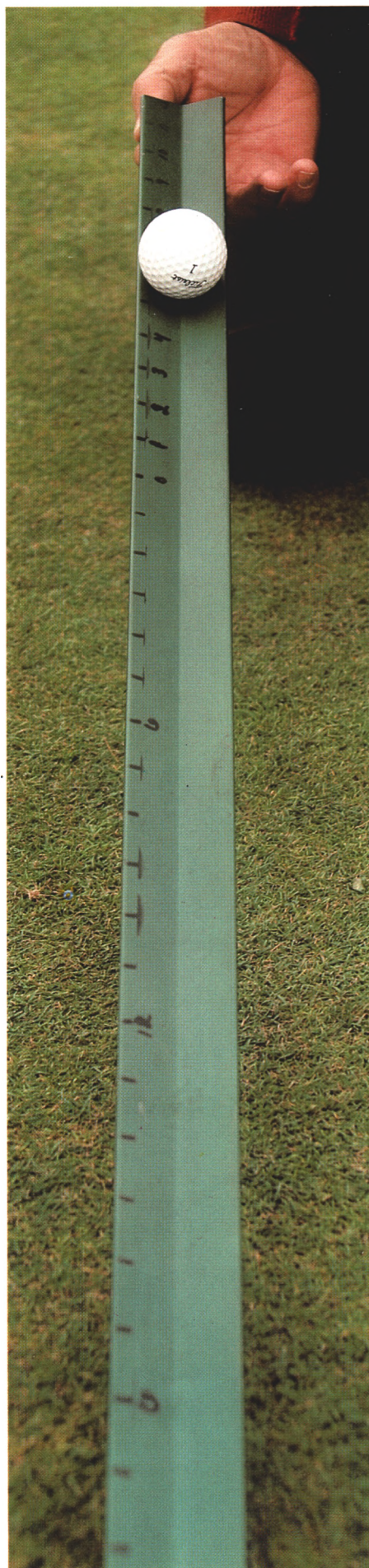
	Regular Membership Play	Tournament Conditions
Fast	102"	126"
Medium Fast	90"	114"
Medium	78"	102"
Medium Slow	66"	90"
Slow	54"	78"

A seldom asked question is, "How has the shift to fast greens changed green maintenance?" It has narrowed the margin between green survival and failure. Closer mowing causes shorter roots, increases summer soil temperatures, and the thinner turf encourages more weed problems (which increases the need to risk herbicide use). It has caused a shift from moderate use to too much nitrogen in the past to very low rates of nitrogen. It seems a slight increase in growth causes a noticeable drop in the "bare floor" speeds of the faster greens. Some golf course superintendents are inclined to omit the minimal nitrogen needs rather than risk the wrath of the golfer. The major problems with low nitrogen are: 1. more weeds (including moss) and 2. more blemishes which show on the grass because they heal slowly. Without new growth that can be mowed into a smooth surface, the demand for closer cut increases.

IT IS POSSIBLE that very close mowing has opened the door to some additional problems. Trouble with a bacterium has been suspected. A major turf failure occurred in another region recently that received little agreement from a series of turf experts. It is possible these problems are the result of new diagnostic facilities for discovering things that are new or were overlooked in the past. However, close mowing causes a weaker turf that is subject to more temperature stress and is likely to permit problems that did not occur in the past.

The golf course superintendent and other turf professionals are willing to provide whatever the golfer likes, if it is feasible without excessive failures. In the spring, next summer's turf loss is farthest from the golfer's mind, but late August always finds some clubs greatly distressed. Winter injury may seem far away, but extremely close mowing will increase this problem. Needless to say, no one suffers more than the golf course superintendent when turf fails.

As with the song from *Oklahoma!* closer-cut has gone as far as it can go. There is a point of no return. Some of the courses with very heavy traffic, especially public courses, need growth on the greens for the turf to recover and survive. Also, where is the point when



an increase in green speed makes putting an experience in anxiety rather than a form of relaxation?

The Stimpmeter has received mixed acceptance by golf course superintendents. The pluses are: 1. It is an impersonal and objective measurement that should prevent irate golfers from making exaggerated statements about speed of the greens; 2. its use has shown that various uncontrollable factors prevent uniform speed at all times; 3. it is a simple and quick tool; and 4. it is an encouragement for the club to agree on a green speed that keeps the golf club and superintendent out of wasteful and harmful controversy.

The Stimpmeter becomes a liability or a cause of resentment when: 1. Some golfers expect precise green speed from day to day which is not possible; 2. the increased green speed causes more precarious maintenance of greens; 3. it encourages such things as petty daily checking, posting of green speed, and requests for special mowing for everyday golf (the superintendent and the maintenance crew often find completion of six or seven mowings per week in all kinds of weather very difficult and demanding without these details); and 4. some clubs would spend time and money on excesses with the Stimpmeter and fail to overcome greater imperfections.

SOME SUGGESTIONS for those who would use the Stimpmeter or strive for very fast greens are:

1. For everyday play, limit the Stimpmeter's use to several times per season to determine if the speed falls within a reasonable range. Except on rare occasions, avoid fussy frequent checking for a consistent precise speed.

2. Most club tournaments do not justify checking green speed and use of extra mowing.

3. Avoid abrupt lowering of the height of cut to increase speed — this applies, especially in late spring and summer, when the safety margin for turf survival is very thin already.

4. On courses where turf survival on greens is marginal, greens rated fast (8 feet and above) may be a mistake.

5. A given club should avoid extremes of speed and hopefully stay within a reasonable norm for similar courses.

A Rolling Stone . . . and Healthy Turf

by JAMES T. SNOW

Director, Northeastern Region, USGA Green Section

WHAT DO ROCKS and putting greens have in common? Not much you might say, although we always have the local golf cynics who will claim that the greens are as hard as rocks at certain times of the year. More and more commonly, though, putting greens in northern climes experience vegetation growth of the kind normally associated with rock outcroppings, tree trunks and the spaces between patio blocks . . . that is, moss growth.

The number of golf course greens experiencing moss encroachment has risen dramatically in recent years, fed by the unquenchable thirst of some golfers for the golfers' ultimate grail, *fast greens*. In other words, in providing the turf conditions that inspire fast greens, golf course

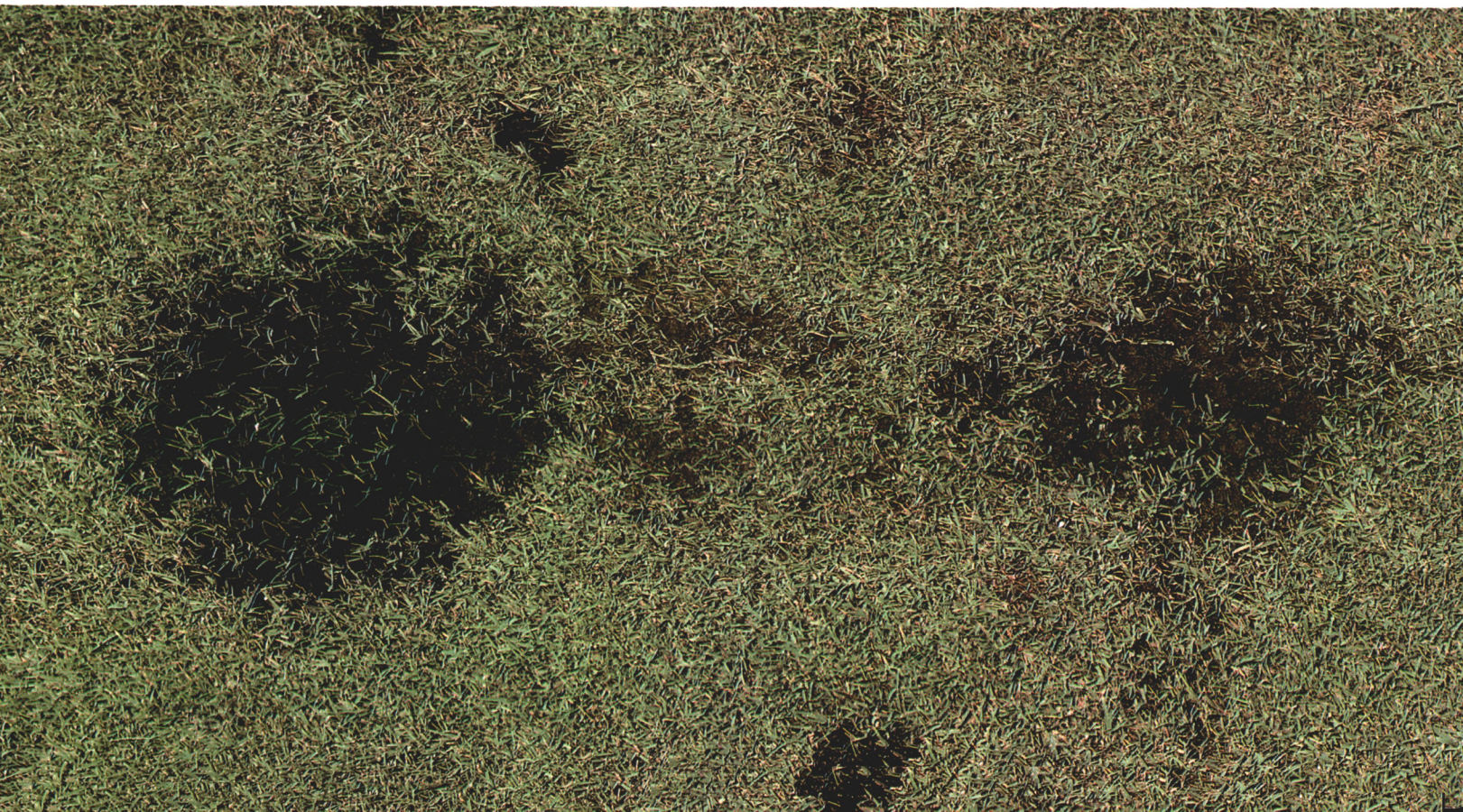
superintendents have unsuspectingly hit upon the formula for promoting moss growth. Perhaps a look at the environmental conditions that favor moss growth will shed more light on this subject.

If you think about where you've seen moss growth occurring, at least one feature is almost always true. That is, such growth usually occurs where nothing else grows well, where there is no competition, and in what most people would probably consider a hostile growing environment. It seems to be able to become established on rocks, tree trunks and other inhospitable locations during cool, damp periods, surviving hot, dry spells by becoming semi-dormant, and resuming growth when weather conditions are again favorable. Moss repro-

duces by emitting spores into the air, which can be carried long distances by the wind. The spores that land on moist or damp substrates can develop into new plants, especially where there is little other competition for space from other plants.

Though there are hundreds of species of moss in nature, only a few are common in turfgrass stands. The most important, particularly where putting greens are concerned, is the group of upright types which commonly occur under dry, infertile conditions. Formerly found primarily on bunker banks and on thin, unirrigated rough mounds, these types of mosses are apparently finding growing conditions on putting greens in some areas.

Moss beginning to die, 12 days after application of iron sulfate.



SINCE MOSS initially establishes itself on substrates with adequate moisture and light, and in the presence of little other competition, it follows that moss encroachment on greens occurs first in the persistently thin, weak areas during the spring and fall, when growing conditions are favorable. Moss is often first seen on high mounds that suffer from repeated scalping and thin areas resulting from triplex ring. As long as other turf areas on the green remain vigorous and reasonably dense, moss will generally remain confined to the persistently weak locations. If turf growth can be improved in the thin areas, the moss will often disappear altogether.

So what does the quest for fast greens have to do with the sudden, increased incidence of moss on greens? To digress for a moment, for many years greens were cut at a height of 3/16 to 1/4 inches, fertilized somewhat heavily at rates of six to ten lbs. N/1,000 square feet per year, and mowed three or four times per week whether they needed it or not. Under these conditions, turf growth was dense and vigorous, affording too much competition for moss to become established. As technology became more sophisticated, as demands for improved playing conditions increased, and as our understanding of turfgrass science improved, cutting heights and fertilization levels were reduced and mowing frequency was increased, but not to the point where moss could become competitive with the turf. Wide use of the Stimpmeter in the mid-1970s, however, and the subsequent over-emphasis on green speeds by some golfers have placed heavy demands on golf course superintendents to produce consistently fast greens, regardless of the consequences.

To satisfy golfer demands for greater and greater green speeds, superintendents have pushed turfgrass science, and the turfgrass plant itself, to the limit. Cutting heights and fertility levels have been reduced, irrigation schedules have been cut back, mowing frequencies have been increased, and the turf is routinely thinned by means of verticutting, brushing, combing, etc. It is not uncommon to find greens today that are cut seven or more times per week at 1/8 inch or less, fertilized at less than one pound N/1,000 square feet per year, double verticut once per week or more, and receiving irrigation schedules designed only to keep the soil firm and the grass alive.

Credit must certainly go to the superintendent who has the skills to keep the turf alive under these conditions, but in

the process of keeping the grass thinned and subdued to such an extent, moss is able to become established and thrive on putting greens. Ultimately, the turf is so lacking in vigor that it can't compete successfully with the moss!

HAVE WE REACHED the limit? Most would agree by these descriptions that we have, and that the pendulum must now begin to swing the other way. The quest for faster greens must now be tempered by the need to maintain adequately vigorous turf to ward off moss invasion and other problems.

Finding the proper balance between cutting heights and fertility levels seems to be the key to solving the moss problem. On experimental plots at Penn State University, moss encroachment was one of the first observations made on plots cut at 1/8 inch or less. Thus, if close cutting heights are desired, then greater amounts of nitrogen fertilizer should be used to maintain a reasonably dense, vigorous stand of turf. Where higher heights are utilized (approaching 3/16 inch), the use of lighter rates of nitrogen fertilizer should be inconsequential as far as moss encroachment is concerned.

On putting greens where moss is already well established, a change in the maintenance program is certainly indicated. If possible, the cutting height should be raised to 3/16 inch and the nitrogen fertilization schedule should be increased to 1/2 to 3/4 pound N/1,000 square feet/growing month, or three to five pounds N/1,000 square feet for the season in northern areas. During this time, regular verticutting, brushing, etc., can be utilized to help keep the greens smooth, true and reasonably fast. Once the moss has been eliminated, the ultimate balance between cutting heights, fertility levels and green speeds will have to be determined.

Interestingly, despite what you often read, pH seems to have little to do with moss establishment. Throughout the northern range of states, moss has been as great a concern on greens measuring seven or eight on the pH scale as it has on greens with a pH of six or below.

ON GREENS where moss has gained a substantial foothold, chemical treatment may be desirable to suppress the moss while the turf becomes reestablished. Hydrated lime and several commercial moss-killers have been used, but the most consistent results have been obtained with an old standby, iron sulfate. Iron sulfate crystals can be mixed with

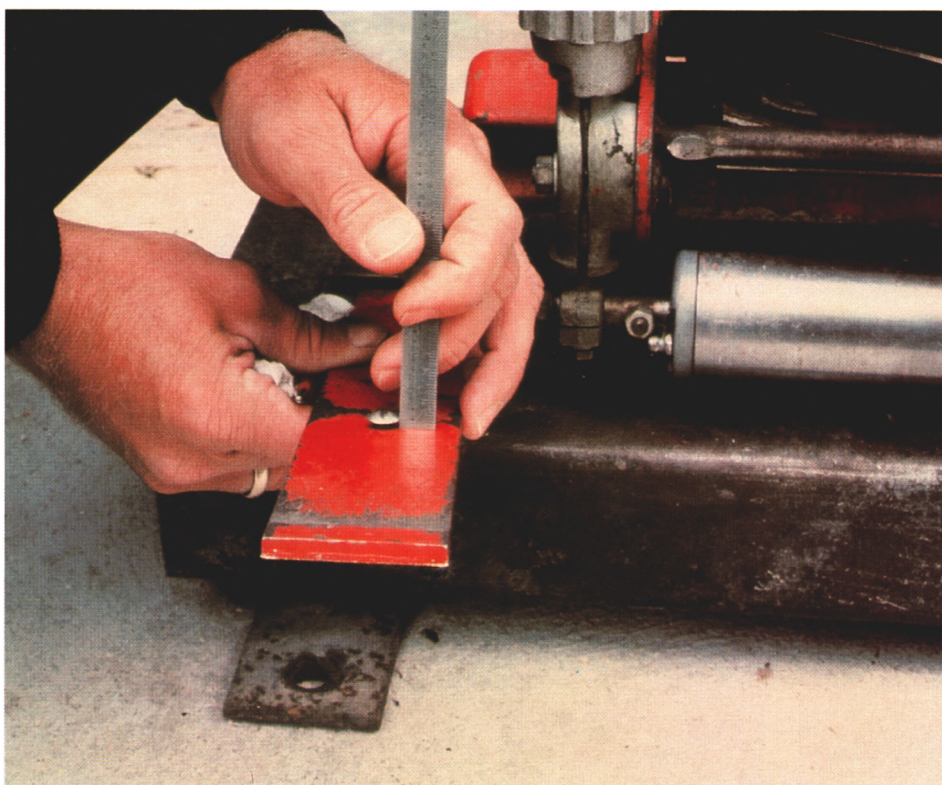
sand, for ease of application, and put down at a rate of four pounds iron sulfate/1,000 square feet. Ammonium sulfate is sometimes mixed with the iron sulfate and sand at a rate equivalent to one pound N/1,000 square feet. The mixture should be watered in soon after application. These materials have a scorching effect on the moss, and the ammonium sulfate also provides nitrogen, which encourages the turf to grow and fill in the voids left by the dying moss. A single application of this witches' brew will probably not produce a complete kill of the moss, so several applications may be required over a period of several years. Verticutting the green prior to the application sometimes improves the effectiveness of the treatment. When applied





(Above) Persistent weak areas, such as those resulting from triplex ring, are often the first places where moss makes its stand.

(Left) Consistently close mowing can encourage the establishment of moss.



during the cool fall or early spring weather, the iron sulfate turns the grass a very dark color, but does not actually harm the turf. It would be wise to try this treatment on a small area first, before treating large portions of the greens.

Though iron sulfate treatments for moss control have been successful on many golf courses, moss will almost inevitably return to the greens unless a change is made in the cultural management program. Thus, chemical control is only a short-term solution, with best long-term results occurring only after the proper balance of cutting height, fertilization rates and irrigation is reached. A wise turf manager once said, "a rolling stone, and healthy turf, gather no moss." Amen!

Dealing with Divots

by **PATRICK M. O'BRIEN**

Agronomist, Mid-Atlantic Region, USGA Green Section



(Above) This old Oaken Bucket helps repair divots.

(Right) Not too unusual for a par-3 tee.





*(Top right)
At Allegheny Country
Club, Pennsylvania,
Superintendent Bill
Schmuck shows a
tee bench.*



*(Right) Lift the lid and it
becomes a divot repair
soil box.*

WHAT TO DO about divots? This is one of those little things that every golf course superintendent must contend with but can never overcome.

Small wonder! The National Golf Foundation reports that the average seasonal daily play today on an 18-hole course is about 150 rounds. That's about 30,000 rounds of golf a year for each of the nation's 18-hole courses. That adds up to a lot of divots and a lot of repair work.

When golf was young, the teeing ground was a small area. Since there was not a great deal of play and the tees were mowed by hand, a good grass cover was

possible. But in time as the number of golfers increased, good grassy tees became more difficult and more costly to maintain. The only answer to the problem lies in larger tees and a constant divot repair program.

Next to providing a level stance for the golfer, size is the most important tee consideration. Without enough ground, grass cannot recover from heavy divoting and traffic. Luckily, it is easy to calculate how much area is needed. For par-4 and par-5 holes, 100 square feet of usable area is required for every 1,000 rounds of golf annually. For par-3 holes, 200 square feet is needed. Tees meeting these general guidelines will have a better chance of

keeping a dense cover throughout the playing season. This is an important consideration for anyone planning to rebuild old tees or designing new ones.

The use of fast growing grasses on tees with divot problems is another aid. In northern climates, some favor Penncross bentgrass while others prefer improved perennial ryegrasses. In southern areas, various bermudagrass and zoysiagrass varieties are the choice. Obviously there are growth rate differences, even among grasses of the same species. For example, the faster growing Vamont bermudagrass is preferred over the slower growing Midiron bermudagrass for tees where these varieties are adapted.

Good tees, regardless of the grass species, absolutely require very close attention to fertilization rates, irrigation needs and pesticide protection. These needs are even greater when cutting heights are lowered and grass clippings collected. Many tees have become an intensive management area.

Although there are no set rules for divot repair programs, the greatest hope of all remains with the golfer himself. If every golfer would only repair his own ball marks and replace his own divots, the nation's golf courses would be conspicuously improved and noticeably less expensive to maintain. Proper etiquette calls for this, but too few hear the call. Surely, if golfers would limit their practice swings to off-tee areas only, a tremendous leap forward could be made.

THE PRACTICE of placing topdressing containers on par-3 tees has made a small comeback in recent years after being commonplace in the 1920s and 1930s. A few clubs use the topdressing containers as tee markers

and some have also included small topdressing containers on every electric golf cart. Each container holds the divot topdressing mixture, seed and a scoop. The scoop is used to place topdressing over the scar left if the divot is destroyed.

The self-repair approach, unfortunately, receives only mixed reviews. Many golfers are apathetic. Agronomically, it doesn't take long for the seed to germinate in the mix and the helpful golfer may find a mass of vegetation in the container. One solution is to place the seed in a dispenser, like a salt shaker, to keep it dry and prevent germination. But each new step in the self-repair process only seems to complicate and discourage its use even more.

The best approach to divot repair is a regular program by the professional grounds staff. The professional staff is more proficient than most golfers in judging how much topdressing to place over an old divot hole. Usually, doing the work once or twice a week is enough if the tees are sufficiently large. Most often, one or two crew members apply the divot mixture by hand to the injured

areas. The next step is to smooth the area with a shovel and then off to the next tee. Devoting time to divot repairs pays dividends. The golfers, too, become more conscientious about repairing injured turf when they see that the professional staff is devoting time to it.

THE DIVOT MIXTURE used by the professional staff is usually one of seed, soil, and/or sand. Seed germination of cool season grasses such as bentgrass, is more difficult in sand alone. On the other hand, actively growing warm season grasses will readily spread in pure sand and rapidly cover without the need of additional seed and soil.

Good tees and a dense, uniform turf cover undeniably add to the enjoyment and attractiveness of every golf course. Good tees don't just happen. They must be of adequate size, have the proper grass, and, follow a conscientiously planned management and divot repair program. Good tees cost money. The enjoyment they bring and the impression they leave make it all worthwhile.

A good tee leaves a lasting impression.





News Notes for Early Winter 1984

James F. Moore becomes new Mid-Continent Regional Director

James F. Moore, who joined the Green Section staff last August, became the Mid-Continent Regional Director in October, 1984, when **Dr. Douglas T. Hawes** left. Dr. Hawes served in this capacity since 1978.

Jim Moore is a graduate of Texas A&M University. He has 12 years of golf course experience, the last seven as golf course superintendent at Ridgewood, C.C., Waco, Texas. He served as president of the Texas Turfgrass Association, in 1984, and is a Class A Member of the GCSAA. Jim has also served six and a half years with the U.S. Air Force as a systems electronics specialist. He has received a number of honors both in civilian and military careers. Kay is his wife, and they have two children.

The Green Section Mid-Continent Regional office has now moved from Dallas to 300 Sharron Drive, Waco, Texas 76710. The new phone number is (817) 776-0765. We are very fortunate and pleased to have Jim Moore as a member of the Green Section staff.

James M. Latham, Jr., rejoins the Green Section

In a bi-lateral move, **James M. Latham, Jr.**, rejoins the USGA Green Section staff after an absence of 24 years and becomes the North-Central Regional Director on December 1, 1984.

Jim Latham was a member of the Green Section staff from 1956 to 1960. He then moved to the Milwaukee Metropolitan Sewerage District, Milwaukee, Wisconsin, where he followed O.J. Noer and Charles G. Wilson as Manager of Marketing and Agronomy. He received his Bachelor and Master of Science degrees from Texas A&M University. Jim has consulted extensively in turfgrass management and has written in many popular and scientific journals. He is a member of the American Society of Agronomy, the GCSAA, and numerous other professional organizations.

The Green Section is pleased to have Jim Latham return to the staff.

Stanley J. Zontek becomes Mid-Atlantic Regional Director

After four years as Director of the North-Central Region, **Stanley J. Zontek** now moves to the Mid-Atlantic Region in the same capacity. He joins **Patrick M. O'Brien**, Mid-Atlantic Agronomist, in serving clubs in Pennsylvania, Delaware, Maryland, Virginia, West Virginia, Ohio, and Kentucky.

Stan Zontek is a graduate of Penn State University. He was born and raised in West Virginia, where his father was a superintendent/professional. Stan served earlier as Director of the Green Section's Northeastern Region, and, he has been a member of the staff for 14 years. His broad experience, particularly with the cool and warm season grasses in the transition zone, brings an exceptional talent to the Mid-Atlantic Region.



*James M. Latham, Jr., and
Stanley J. Zontek.*

James F. Moore



STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

(Act of October 23, 1962; Section 4369, Title 39, United States Code.) 1. Date of Filing — October 19, 1984. 2. Title of Publication — USGA GREEN SECTION RECORD. 3. Frequency of issues — Six issues a year in January, March, May, July, September and November. 4. Location of known office of publication — Golf House, Far Hills, N.J. 07931. 5. Location of the headquarters of general business offices of the publishers — Golf House, Far Hills, N.J. 07931. 6. Names and addresses of Publisher, Editor, and Managing Editor: Publisher — United States Golf Association, Golf House, Far Hills, N.J. 07931. Editor — William H. Bengeyfield, Golf House, Far Hills, N.J. 07931. Managing Editor — Robert Sommers, Golf House, Far Hills, N.J. 07931. 7. Owner (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of individual owners must be given). If owned by a partner, partnership or other addresses — United States Golf Association, Golf House, Far Hills, N.J. 07931; President — James R. Hand, Golf House, Far Hills, N.J. 07931; Vice-Presidents — William J. Williams, Jr., and William C. Battle, Golf House, Far Hills, N.J. 07931; Secretary — C. Grant Spaeth, Golf House, Far Hills, N.J. 07931; Treasurer — Edward E. Marshall, Golf House, Far Hills, N.J. 07931. 8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities — None. 9. Paragraphs 7 and 8 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner. Names and addresses of individuals who are stockholders of a corporation which itself is a stockholder or holder of bonds, mortgages or other securities of the publishing corporation have been included in paragraphs 7 and 8 when the interests of such individuals are equivalent to 1 percent or more of the total amount of the stock or securities of the publishing corporation. 10. This item must be completed for all publications except those which do not carry advertising other than the publisher's own and which are named in sections 132.232 and 132.233 Postal Manual (Sections 4355a, 4344b and 4356 of Title 39, United States Code).

	Average No. Copies Each Issue During Preceding 12 Months	Single Issue Nearest to Filing Date
A. Total No. Copies Printed (Net Press Run)	14,000	14,000
B. Paid Circulation		
1. Sales through Dealers and Carriers, Street Vendors and Counter Sales	0	0
2. Mail Subscriptions	1,300	1,300
C. Total Paid Circulation	1,300	1,300
D. Free Distribution (including samples) by Mail, Carrier or other means	12,400	12,400
E. Total Distribution (Sum of C and D)	13,700	13,700
F. Office Use, Left Over, Unaccounted, Spoiled after Printing	300	300
G. Total (Sum of E and F)	14,000	14,000

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

Robert Sommers, Managing Editor

TURF TWISTERS

TIS THE SEASON

Question: The conifers on our golf course are seasonally the prey of Christmas tree poachers who steal prime specimens during December. Short of hiring armed guards, is there anything that can be done to discourage this activity? (New Jersey)

Answer: Several golf courses have had good luck applying a material to the trees called MGK Big Game Repellent. It contains 37 percent putrescent whole egg solids, emitting a malodorous scent which discourages potential tree poachers. The material can be obtained by contacting the McLaughlin Gornley King Company, 8810 - 10th Avenue North, Minneapolis, MN 55427. This material is also useful in preventing damage to trees and ornamentals by browsing deer.

FOR JACK FROST

Question: What's the USGA's position on winter play on greens? I'm in a running battle every year about this time. (New Jersey and Washington)

Answer: The USGA does not have a policy on "winter greens," but we all agree — winter play on regular greens causes serious agronomic problems. Small, well maintained temporaries allow the golfer to enjoy the game while saving the regular greens from unnecessary winter time abuse. See the September/October, 1984 RECORD and Bud White's article, "Playing Par with Jack Frost." And good luck with a problem that just doesn't seem to go away.

AND MORE STATISTICS

Question: A recent newspaper article reported that Americans are more likely to be injured and sent to the hospital emergency rooms by stairs, ramps, and landings than any other cause (531 injuries per 100,000 Americans). The most severe injuries are caused by cigarette lighters (8.7 injuries per 100,000 persons). I have also recently read that nearly 50,000 young people die each year in this country from illicit drugs!

How many deaths from pesticide use on golf courses have you heard about in 1984 and what do you think about all of this? (Michigan)

Answer: A. Zero.

B. No argument with your statistics.