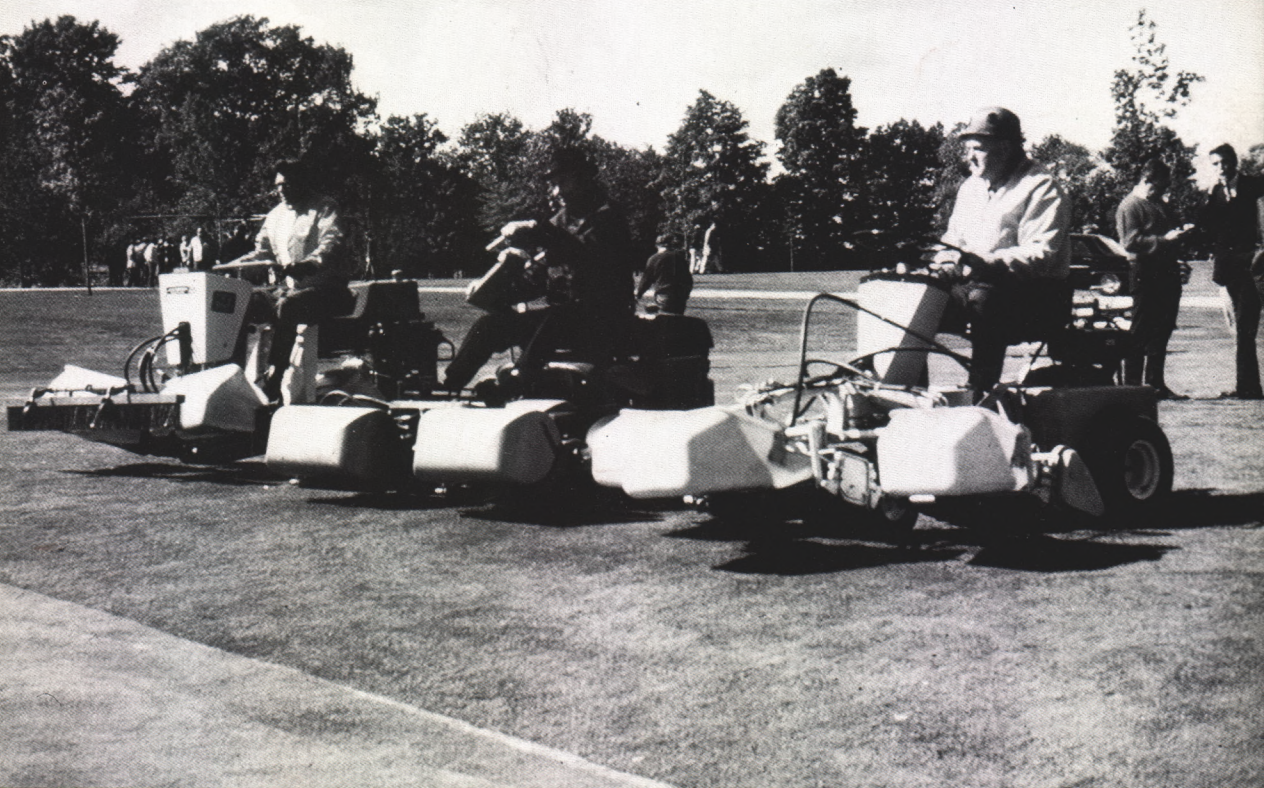


MAY 1971

USGA GREEN SECTION RECORD

A Publication on Turf Management
by the United States Golf Association

*The Green Section on Triplex
Putting Green Mowers*





USGA GREEN SECTION RECORD

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The Green Section Staff Members contributing to this interview: from left—William G. Buchanan Duane Orullian, William H. Bengueyfield, F. Lee Record, James B. Moncrief, Alexander M. Radko, and Holman Griffin.

Triplex Putting Green Mowers

What weighs about 1,000 pounds; costs about \$3,300; comes in orange, yellow, or red, and somehow gains both supporters and detractors each day? The triplex putting green mower may be the greatest innovation in equipment since power machinery came to the golf course! But is it all good?

Just a year ago readers of the GREEN SECTION RECORD were promised a nationwide report on triplex putting green mowers by the Green Section Staff. The survey was delayed until now so that each Staff member would have an

opportunity to observe all makes of triplex mowers under field conditions and, with the added perspective of time, be better able to comment. Actually, it would be more comfortable to wait another year, but a report of this sort cannot be delayed forever.

The jury may still be out on many of the points raised in the following discussion, and opinions may well change. We publish the following report only in the belief that "current views are current news." We believe you will be interested in the comments, observations and

opinions of the Green Section agronomists today. The views are based on hundreds of personal contacts with golf course superintendents, Green Committee Chairmen, club professionals and others directly concerned. They are based on triplex putting green mower observations after weeks, months and years of use under all kinds of conditions. You may not find yourself in complete agreement, but we trust you will find the following exchange interesting, stimulating and thought-provoking.

The conversation took place in New York last January during the annual USGA Conference on Golf Course Management. Participating in the staff discussions were:

ALEXANDER M. RADKO, Eastern Director
WILLIAM G. BUCHANAN, Eastern Agronomist
HOLMAN M. GRIFFIN, Mid-Atlantic Director
JAMES B. MONCRIEF, Southern Director
LEE RECORD, Mid-Continent Director
WILLIAM H. BENGUEYFIELD, Western Director
G. DUANE ORULLIAN, Western Agronomist.

It was an afternoon of lively comment.

MODERATOR: *What percentage of courses will use the triplex mower on greens in 1971?*

RADKO: Most courses in the East either have used one, or plan to use one on greens full or part time this year. By the end of 1971, I would guess 75 per cent of our clubs will have one.

GRIFFIN: I really don't know, but I would have to estimate over 50 per cent.

BENGUEYFIELD: Yes, at least 50 per cent of the Western clubs we visit will be using the triplex this year. The number will surely increase for the next several years, especially in their use on tees. In fact, that's where I feel the present triplex putting green mowers are going to find their greatest use in the future—on tees!

MONCRIEF: There's no question their use on tees and collars is increasing daily. With the changing of mowing units now so easy, we will see the triplex used much more than on greens alone.

RADKO: But under present economic conditions, the new mowers may be too costly and perhaps too finely adjusted for some rough tee areas. And tee cleanup may also be necessary before mowing. However, as older equipment wears out, the greens triplex may well come into more prominent tee use. Everyone enjoys closely clipped tees.

BENGUEYFIELD: Yes, and the tees may be mowed more frequently and clippings removed. One man could do a superior job on tees and at no greater cost than most present practices.

MODERATOR: *How does the size and contours of greens affect the use of triplex green mowers—and tees too for that matter?*

RECORD: I'm sure there isn't a green or tee too small to mow with a triplex unit if there is an adequate collar on which to turn the machine.

ORULLIAN: Right. It's not the size of the green but what surrounds it; bunkers, steep slopes, trees, etc. that makes the difference.

BUCHANAN: As to mowing severe green contours, there could be a problem with the machine at the bottom of a steep slope where contours level off and a particular angle or direction of cut is involved. I don't believe these units can do a good mowing job on severely contoured greens.

RECORD: Especially when a brush is being used. On undulating and severely contoured surfaces, the brush treatment is very hard on the playing surface. Problems have developed here.

MODERATOR: *We are all familiar with the labor saving advantages of the triplex mowers, but are there any other advantages?*

GRIFFIN: Most of the advantages—and there are several—are really tied into labor saving and money saving considerations. But the new units also make golfers happier because the maintenance crew is not in the way as much.

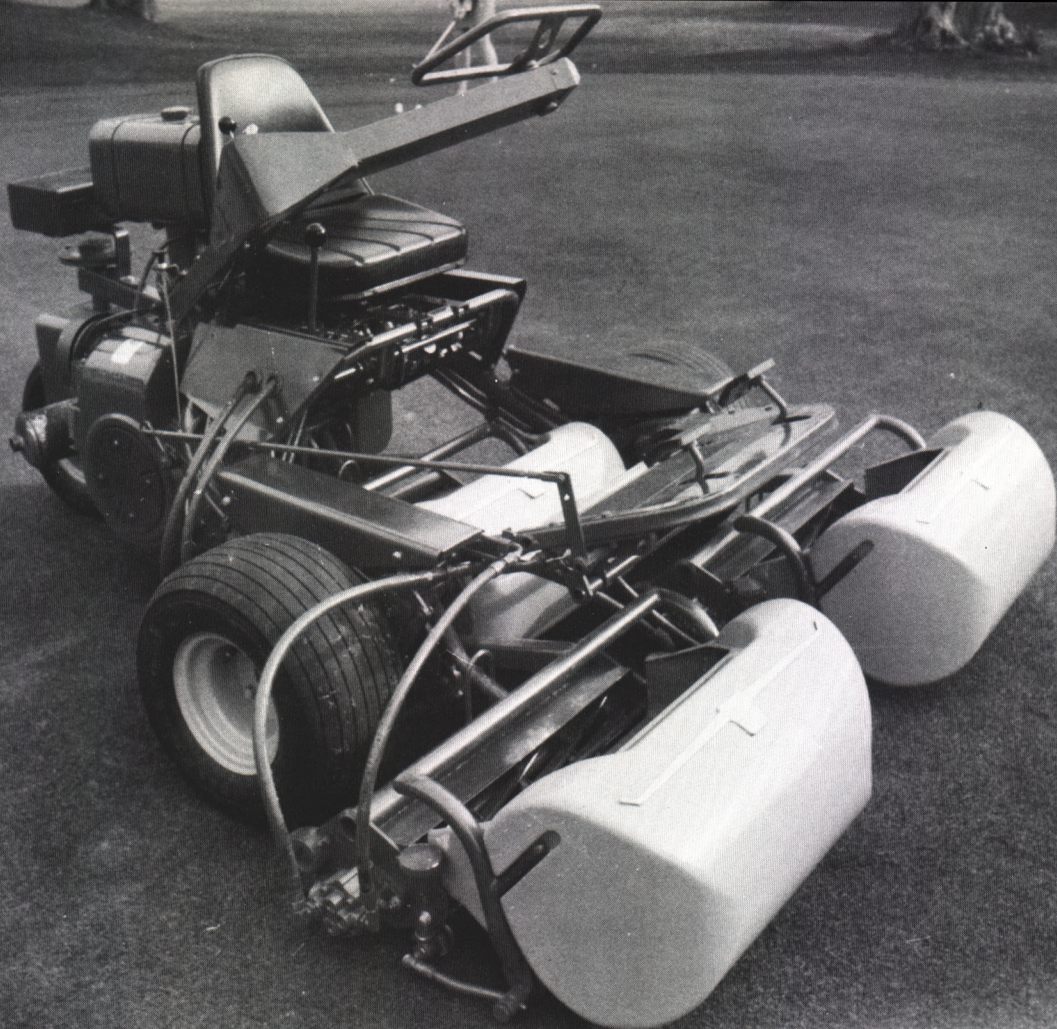
MONCRIEF: And that's an important point. Greens can be mowed faster and play is not held up.

RADKO: And it's a great machine to have in an emergency. It reduces the weekend labor requirement and pleases the weekend golfer. If for no other reason but to mow greens on Saturdays and Sundays, the triplex is well worth the investment.

BUCHANAN: I think too there will be a tendency to improve workmanship on the greens. Only *one* man will be operating the equipment and he'll be very good at it.

ORULLIAN: Some superintendents have told me there is a savings on equipment parts as well. They believe it is less expensive to maintain one or two triplex units rather than six or eight conventional units.

RECORD: For a minute, let's go back to the labor saving aspect. I can't necessarily agree that mowing with a triplex is a total saving in labor. It may be labor-saving for the mowing operation, but an increase in other operations; vertical mowing, thatching, top-dressing, have become necessary where the triplex has been used exten-



The Toro Greensmaster

sively. This equipment has created additional problems during periods of the year when labor is short and cultural programs have to be carried out.

ORULLIAN: Yes, and the smaller the greens, the less economic advantage there may be to triplex use.

MODERATOR: *Okay. Let's talk about some of the disadvantages.*

RADKO: Grain, thatch and compaction are definitely increased with triplex mowers. How serious they may become only time will tell.

BENGEYFIELD: Since the spring of 1968, at least one triplex mower has been in use on the greens of a club in Palm Springs, Calif. At first everyone was pleased with the performance, including touring professionals. With time however, increased grain developed; tracking or worn wheel paths became noticeable on the green perimeter and the "quality of cut" definitely lessened. In fact, the conven-

tional, hand walking mowers are now used prior to the tour event and other important tournaments. I've seen the same results at course after course during the past three years. With time, the quality of cut definitely suffers.

BUCHANAN: Well, the quality of cut may not be quite as good, but it's better than first expected. Superintendents soon learn they must set the mowers about 1/16-inch *lower*, than the single unit mowers. However, I agree that the possibility of increased thatch and grain from continuous triplex use is real.

ORULLIAN: With vigorous bents such as Pennncross, an increase in grain and thatch is most evident. Even *Poa annua* greens tend to have more puffiness and mat. I think part of the problem is associated with the cutting height adjustment of individual mowers, and some report that bedknife thickness is also a factor.

MONCRIEF: I hear pros and cons on this, but

so far I feel the quality of the putting surface is just as good with the triplex as with the walking single unit. If the equipment is functioning properly, mowing should be comparable.

MODERATOR: *Some mentioned "ridging" and wheel marks. Any comments?*

MONCRIEF: I've seen many instances where grass has thinned and not been able to take the wear and tear of the triplex, especially during July and August. Perhaps this is what you mean by "quality of cut." But in any event, perimeter areas have been damaged and walking mowers must then be used. Of course, alternating the mowing pattern or track will help avoid the problem.

ORULLIAN: On the other hand, I've seen heavy rutting of 1/4-inch deep or more persistently occur on tight turns near green perimeters. I haven't seen any unevenness on the green itself however. And soil compaction especially under wet, soggy conditions is another reason not to sell off the older, smaller mowing units.

GRIFFIN: Speaking of wet conditions, several superintendents report wet grass clippings

dropping on the green from wheels and rollers of triplex units. This is more of a problem than with the conventional green mower. Some wheel slipping and tearing of sod while transporting has also been reported under wet conditions and steep slopes. Of course neither of these problems occurs under dry conditions.

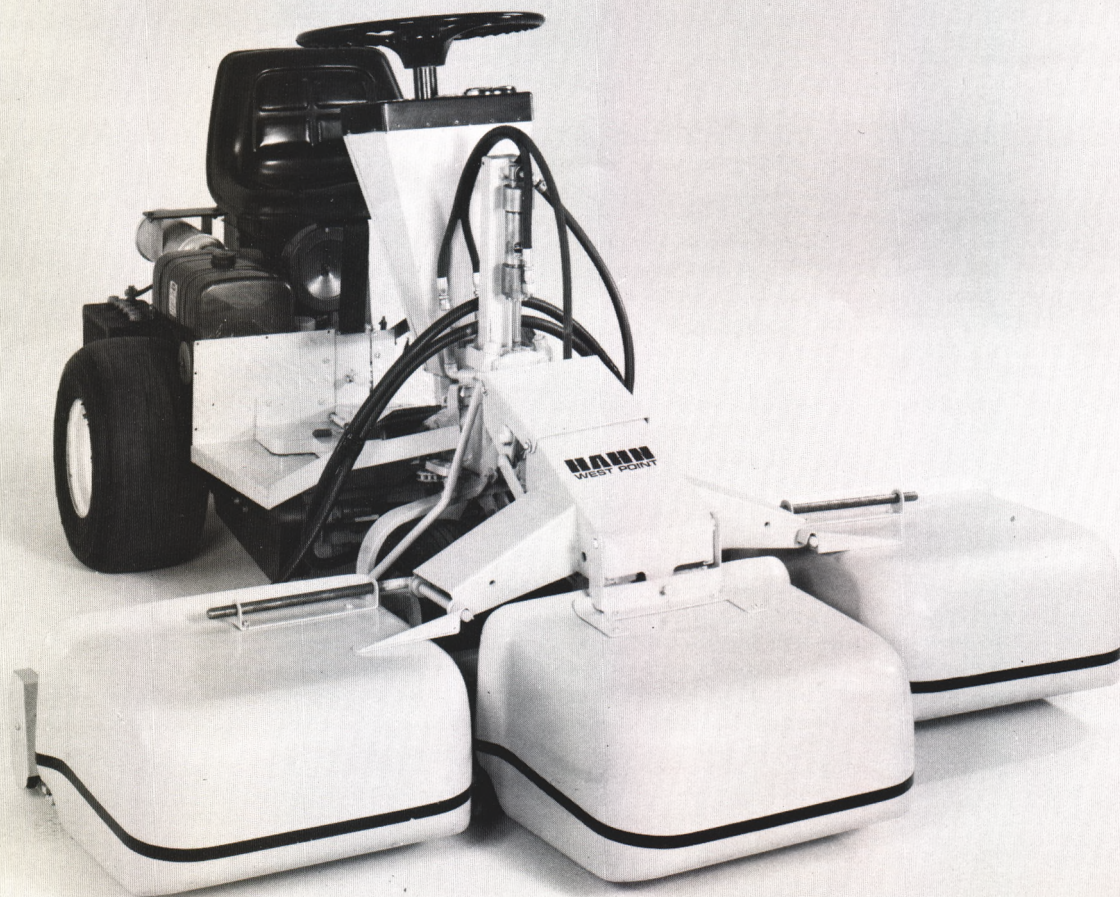
MODERATOR: *What type of mowing pattern, i.e., circular or row mowing, do you most frequently find?*

BUCHANAN: Striped or row mowing is by far the pattern most frequently used in the Northeast.

BENGEYFIELD: I doubt if any kind of circular mowing pattern will persist very long. It's the grain problem again. And of course, when you go to row mowing, you lose some of the time saving advantage earlier attributed to the triplex mowers. Instead of one man now mowing 18 greens in three hours (circular pattern), he may take four hours or more to follow a stripe or row mow pattern.

MONCRIEF: Row mowing is also the most popular procedure across the South. It may be a holdover from the old days, but changing the angle of cut from day to day

The Hahn-West Point Triplex Riding Greensmower





The Jacobsen Greensking Mower

still seems important in order to have good putting surfaces.

MODERATOR: *The problem of grain comes up again. Are present triplex brushes adequate?*

GRIFFIN: No! I probably haven't seen all the models, but those I have seen leave a lot to be desired. Certainly improvements and adjustments in brushes can be made.

ORULLIAN: Some superintendents have objected to one large brush in front. They prefer individual brushes located between the roller and the reel—not in front of the roller.

RADKO: My observation of triplex brushes has been limited, but I think another factor is involved in graininess, and it is concerned with the "floating reel." The principle is a good one, but it also presents some problems in grain and thatch buildup that should be discussed. The floating reel seems to ride up ever so slightly, and over a period of time grain and thatch accumulate.

RECORD: Agree! The so-called "floating

head," although it may reduce forces of compaction, has not produced a more thorough mowing job when compared to a "fixed head."

ORULLIAN: Most superintendents I have spoken with favor a floating reel but would like to see certain improvements made. For example, one man went so far as to put 3-pound weights on each mower to try to achieve a better mowing job.

BENGEYFIELD: It does seem important to have some force to hold the cutting edge into the turf, and I suppose the amount of force would vary with the type of grass, density, moisture content, etc.

BUCHANAN: For the laborer, the floating head reduces the danger of scalping and/or riding. For the superintendent, there seems little doubt that the floating head increases grain and thatch. For the golfer, the greens may putt slower, perhaps even less true. To the agronomist, it's really too early to fully judge the floating head. The disadvantages may easily be overcome with more vertical

mowing and top-dressing. We really don't have the answers.

MODERATOR: *In your opinion, how important is the skill of the operator and mechanic in the operation of triplex putting units?*

RADKO: All important! The more sophisticated the machine, the better the operator must be. The operator must be alert to every possibility and he must react immediately. Greens are prime turf areas: they must be carefully maintained, and good mowing technique is an important part of green care.

MONCRIEF: The triplex mower, although relatively easy to operate, needs a mature and experienced operator. As his operation proficiency improves, the mowing job also improves.

GRIFFIN: The skill of the mechanic is probably more important than that of the operator. This is a fine piece of machinery and needs top care.

RECORD: That may be true, but I have known many top mechanics who were poor operators. I think it's more of a team effort today.

MONCRIEF: There is no doubt that this is a more sophisticated piece of equipment. Both operator and mechanic must be more proficient.

MODERATOR: *Do most clubs using triplex mowers have a back-up mower for emergencies?*

BUCHANAN: As with all new machines, the golf course superintendent likes to play it safe. He will try new machinery, but he will keep the old piece ready just in case.

RECORD: Back-up mowers are definitely needed! Last year I found a number of clubs using the triplex units daily during the spring and fall when labor is short and the smaller walking mowers during the summer when the labor force is likely to be full. It seemed like a good procedure. However, a 3/16-inch height of cut on a triplex is not always a 3/16-inch height of cut on a single unit. During a changeover from one unit to another, serious scalping has occurred.

BENGEYFIELD: There is another type of mowing schedule that became popular last year. The triplex mower was used on the greens for two or three days and then the walking mower for one day (usually with a brush), and so on through the growing season. This procedure seems to take advantage of the best qualities of both machines; i.e., fewer total manhours spent in mowing, but also doing something about the grain and wheel wear problem.

MODERATOR: *We have all heard of the mechanical problems triplex mowers have had; hydraulic leaks, uniform adjustments of mowing units, tire pressure and other related tire problems, frame problems, etc. Any comments?*

GRIFFIN: Basically, all of the triplex mowers have been soundly engineered. The original problems have already been overcome, and this equipment will become even better in time. But any piece of complex machinery is bound to have a problem at one time or another.

MODERATOR: *In looking to the future then, can you suggest any improvements triplex putting green mower manufacturers should consider?*

RADKO: I really don't know. Perhaps the units could be reduced to a narrower width—say 16 to 18 inches. Perhaps this would cut down on the grain and thatch problem and provide an even smoother cut.

BENGEYFIELD: Some improvement might be made in collecting the clippings as they come off the reel and bedknife. A vacuum arrangement might be possible, then during transport to the next green the clippings could be blown out over the fairway or rough areas. We're still spending too much money and wasted time throwing away or removing grass clippings.

ORULLIAN: Perhaps something can be done to reduce total weight and improve weight distribution as well.

RECORD: Triplex units will improve when man realizes that the time element is not the key to successful putting green management. If the superintendent cannot economically cope with increased thatching, thinning and top-dressing, the triplex mower may have already reached its peak for use on greens.

MONCRIEF: These machines may have some disadvantages, but for many, the time saving advantage simply cannot be overlooked. The triplex is here to stay and they are going to get better.

GRIFFIN: Yes—improvements are going to be made. For example, the best features of the three mowers now available could be combined and the final product thereby improved. One of the early criticisms of Green Section-type greens was that they made green management too easy and anyone could do it. Maybe the same fellow who made that statement would like to comment on the triplex mower!

MODERATOR: *Maybe he would. Thank you gentlemen.*

PYTHIUM SPECIES

Associated with Golf Greens in the South

by F. F. HENDRIX, JR., Department of Plant Pathology, University of Georgia, and
JAMES B. MONCRIEF, Southern Director, USGA Green Section

Investments in golf courses and other installations involving turfgrasses total millions of dollars in the Southern United States. The prevention and control of turf diseases is essential in the long-term maintenance of lawns, golf greens, athletic fields, and other areas where utility and esthetic values depend upon the perfection of a grass cover. In recent years a great deal of effort has gone into the recognition of turf diseases and the identification of the associated organisms. Research has shown that effective control measures depend upon the nature of the causal organisms and their requirements for infection and spread.

Pythium diseases of turf have been recognized for many years as being prevalent on bentgrass, bluegrass, fescues and overseeded grasses such as ryegrass. The damage has been attributed primarily to *Pythium aphanidermatum*. As part of a larger study of the distribution of *Pythium* species in soils in the United States, 157 soil samples were collected from problem golf greens from Texas to Virginia and assayed for *Pythium* species. Data

from these assays included the number of infective units of *Pythium* per gram of soil and the identification of the species.

The turfgrasses were classified in four groupings (Table 1). Samples from Tifgreen bermudagrass turf were the most abundant and totaled 67. Forty-nine samples were from common bermudagrass with a few samples from Tifdwarf, Tiflawn and Tifway bermudagrasses. This group is labeled "Bermuda" in this article. The 28 samples from bentgrasses were largely from Penncross. Thirteen samples came from centipedegrass turf.

Over 20 species of *Pythium* were isolated from the golf green samples (Table 2). *Pythium irregulare* was the most common species. This fungus causes a root rot of diverse crops from peach trees to bermudagrass. The root rot disease results in slower growth, off color, and thinning out of grasses in a manner similar to damage caused by nematodes (Figure 1). This fungus probably is not associated with the *Pythium* cottony blight disease of turf (Figure 2).

Figure 1. Effect of *Pythium irregulare* and *P. aphanidermatum* on Tifdwarf bermudagrass. Grass in pots on each end is growing in soil infested with *P. aphanidermatum*. Grass in second pot from each end is growing in soil infested with *P. irregulare*. Grass in center pot is growing in sterile soil.





Figure 2. Cottony blight of ryegrass.

Pythium torulosum was the next most common species found, followed by *P. aphanidermatum*, *P. catenulatum* and *P. dissotocum*. These species usually cause the cottony blight type of disease.

Over 15 other species were found on a more limited basis. The nature of disease caused by these is unknown. Additional research is under way at the University of Georgia to define their effect on turf.

The occurrence of the nine most commonly isolated species of *Pythium* on bermuda, bent, and centipede turf is presented in Table 1. *Pythium irregulare* was most common on bermudagrasses other than Tifgreen, while *P. torulosum* was most common on Tifgreen.

TABLE 1. Occurrence of the nine most commonly isolated *Pythium* spp. from four groups of turf grass.

Pythium spp.	Bermuda	Tifgreen	Bent	Centipede
	Percent			
<i>afertile</i>	7	24	5	0
<i>aphanidermatum</i>	0	20	31	0
<i>catenulatum</i>	10	24	21	0
<i>dissotocum</i>	16	8	0	0
<i>irreg.-debary.</i>	76	39	31	40
<i>rostratum</i>	10	0	16	30
<i>torulosum</i>	10	51	62	0
<i>ultimum</i>	16	8	21	0
<i>vexans</i>	3	20	5	0
Total samples	30	28	19	10

^aSamples from Tifway, Tiflawn, Tifdwarf, and common bermuda.

Bentgrass supported a high and diverse number of species of *Pythium*. These organisms have been observed causing root rot and dying of bentgrass in all seasons of the year. Some species are most active in warm seasons, while others kill and stunt bentgrass during the winter. It seems impossible to prevent *Pythium* disease of bentgrass on some greens.

The species of *Pythium* on centipede grass are among the group that causes root rot and slow decline, rather than cottony blight. Our sampling of centipede grass is very limited and would not warrant any conclusions.

Control of *Pythium* damage should begin with the architect. All new greens should have a fungicide such as Captan incorporated at the time the soil mix is prepared for the green. This should be followed by methyl bromide fumigation. Sprigged grasses should be purchased from nurserymen producing them in methyl bromide treated soil. Excellent water drainage is essential for preventing *Pythium* damage. Waterlogged soil favors these organisms, and the diseases they cause. A regular preventive maintenance program with fungicides such as Captan should be practiced. If the diseases occur despite this, individual trouble areas should be treated with fungicides such as Thiophanate, Koban or Dexon. To establish stands of overseeded grasses, use of seed treated with a fungicide is very helpful.

Golf course superintendents can have soil from their greens assayed to determine the amount of *Pythium* present. Those greens with high populations can be earmarked as potential trouble areas, to receive extra preventative sprays and to be watched more closely in rainy periods.

TABLE 2. Relative abundance of *Pythium* spp. in soil samples from turf problem areas from golf greens in South and Southeast.

Pythium species	Number of samples from which isolated ^a	Number of samples in which indicated species comprised the following percent of total Pythium population			
		10%	20-40%	50-70%	80-100%
<i>afertile</i>	9	6	3	0	0
<i>aphanidermatum</i> ^b	11	1	6	2	2
<i>artotrogus</i>	1	1	0	0	0
<i>catenulatum</i>	13	3	6	2	2
<i>dissotocum</i>	7	6	0	1	0
<i>intermedium</i>	3	1	0	0	2
<i>irreg.-debary.</i>	43	17	11	14	8
<i>middletoni</i>	1	0	1	0	0
<i>myriotylum</i>	2	1	1	0	0
<i>paroecandrum</i>	1	0	1	0	0
<i>pulchrum</i>	1	1	0	0	0
<i>prolatum</i>	1	0	0	1	0
<i>rostratum</i>	9	5	3	1	0
<i>salpingophorum</i>	1	1	0	0	0
<i>splendens</i>	1	1	0	0	0
<i>spinosum</i>	2	1	1	0	0
<i>sylvaticum</i>	4	2	1	1	0
<i>torulosum</i>	28	8	16	3	1
<i>ultimum</i>	11	7	4	0	0
<i>vexans</i>	6	5	1	0	0
<i>P. spp.</i>	31	14	15	0	2

^aTotal number of samples: 95.

^bBased on 10 colonies picked per soil sample. This table can be interpreted in the manner done below for *P. aphanidermatum*. *P. aphanidermatum* comprised 10% of the Pythium population in 1 sample, 20-40% in 6 samples, 50-70% in 2 samples and over 80% in 2 samples.

SUPER SAM by Paprocki





Before

Restoring A Limestone Wall

by PETER BILD, Superintendent, Glen Flora Country Club, Waukegan, Illinois

Water hazards on a golf course are important both for adding to the quality of the game and for enhancing the beauty of the course. Glen Flora Country Club was fortunate to have a natural stream winding across several fairways and rough areas, though the stream banks were badly eroded.

In 1957, a local contractor was hired to build a cut limestone wall in the stream to

remedy the bank erosion problem. This wall was 400 feet in length and varied from three to four feet in height. The stone was laid in layers and was well fitted. The white stone wall made a lovely sight with the arched bridges crossing the stream.

The original wall stood for 13 years, but gradually succumbed to the ravages of winter frost and spring flooding. Eventually, sections



After

of the wall crumbled and erosion was once again a problem on the stream banks. It was decided most practical to rebuild the wall completely. Because it seemed more economical to use our own labor rather than hire an outside contractor, work on the wall was necessarily delayed until the latter part of August, 1970, when some labor time was available.

In the first phase of the operation, all loose limestone was removed from the bottom of the stream. The second phase marked the actual rebuilding of the wall. We began the operation in the rough area to minimize danger to the laborers and lessen inconvenience to the golfers during the busy early fall golfing period. The golf season was over by the time the project was completed in the late fall.

We worked on only 20 to 30 feet of the wall

at a time. The men removed all the stones, laid them out in rows to facilitate choice of the correct sizes for later fitting, straightened the banks and also leveled the stream bed. To make a solid foundation, the largest stones were then placed at the bottom of the wall. One layer was laid at a time until the desired height was reached. All spaces were filled with stone, making the rebuilt wall wider and stronger than the original wall.

To replace missing sections of stone and to make the new wall stronger, an additional 10 tons of limestone was purchased at a cost of \$400. A total of 324 manhours was spent on rebuilding the wall at a cost of \$810. The total cost of labor and materials, including removal of excess dirt, was \$1,210. The maintenance crew took pride in their work and did an excellent job for the club.

New Green Section Office Opens

To better serve Green Section subscribers on the eastern seaboard, a new Mid-Atlantic Region has been established with an office in Charlottesville, Virginia. Holman Griffin has been appointed Mid-Atlantic Director and will work out of the new office serving South Carolina, North Carolina, Virginia, West Virginia, Maryland, Delaware and Western Pennsylvania. The new address for the Mid-Atlantic office is Box 5563, Barricks Road Station, Charlottesville, Va., 22903. The telephone number is (703) 296-5353. The office will be open Monday through Friday from 9 a.m. to 4 p.m.

Holman Griffin has been a member of the USGA Green Section staff since 1961 and now becomes its fifth regional director. He has represented the USGA Green Section in most of the states located in the new Mid-Atlantic region. Earlier he served as agronomist in the Northeast, Southern, and Southwestern regions. During the past 10 years, Griffin has been a guest speaker at many turf conferences and has written numerous articles for national publications on turfgrass management.

New Faces in Green Section Eastern Office



WILLIAM G. BUCHANAN

William G. Buchanan became a member of the Green Section staff in November, 1970. He is attached to the Eastern Regional Office in Highland Park, N.J. Alexander M. Radko is the Eastern Director of the Green Section.

A native of Blacksburg, Va., Buchanan attended Virginia Polytechnic Institute and earned a Bachelor of Science degree in Agronomy. While at VPI, he assisted with research projects conducted at the Turf Research Center. He was a member of the golf team and co-captain during his senior year.

After graduation, Buchanan became assistant superintendent at the Cedar Point Country Club in Virginia. The United States Army Corps of Engineers then called him to active duty, and he served his country for the past three years. He is now Eastern Agronomist for the USGA Green Section.



STANLEY J. ZONTEK

Stanley J. Zontak became a member of the Green Section staff in February, 1971. He, too, is based in the Eastern Regional Office.

Zontek received his Bachelor of Science degree from Pennsylvania State University in 1970. He has carried on research projects at the Joseph Valentine Turfgrass Research Center under the direction of Dr. Joseph Duich and Dr. Herb Cole, of Penn State.

Zontek is a native of Clarksburg, W. Va., and has spent much of his life working on the maintenance crew of golf courses. His first job was at the Manor Country Club in Rockville, Md., where his father was the golf course superintendent. Work on other courses in West Virginia and Pennsylvania continued through his college career.

Green Section Publications

Inquiries are constantly received concerning USGA Green Section publications on golf course maintenance. So that you may have a complete listing of the publications available, the "Green Section Library" is listed below:

Turfgrass Management by H. Burton Musser. An authoritative and practical guide to the development and maintenance of golf turf and other large lawn areas. Available from Golf House, 40 East 38th Street, New York, N.Y. 10016 or your local bookstore. \$10.95.

Building Golf Holes for Good Turf Management. USGA Green Section Staff. \$1 per copy from Golf House.

USGA Green Section Record. A 16-page magazine published 6 times a year. Subscriptions are \$2 per year and may be ordered through Golf House.

A number of reprints on turfgrass management are also available. They are taken from past issues of the Green Section Record on specific subjects of general interest. Single copies are available at no charge from your Regional Green Section office. (Please see inside front cover.)

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| Bentgrasses for Putting Greens | Another Look at Labor |
| Management Basics for Bent Greens in Southern Areas | Golf Course Maintenance Equipment |
| Tifgreen (Tifton 328) Bermudagrass for Golf Greens | Measuring Courses Accurately |
| An Ecological Study of Annual Bluegrass | Municipal Golf Course Operations — Areas of Concern |
| Biology & Control of A Species of Hyperodes | Reviving A Controversy — Bentgrass Overseeding |
| Cart Paths | What's Best for Overseeding Bermuda? |
| The Green Section on Golf Carts | Planting the Golf Course |
| Story of Cohansey | An Eviction Notice for <i>Poa Annua</i> on Fairways |
| Committees: Their Role in Course Economy | Vertical Mowing — Aerification — and <i>Poa Annua</i> Invasion |
| Contracts for Golf Course Superintendents | Golf Course Rebuilding and Remodeling: Factors to Consider |
| Correct Sand for Putting Greens | Record Keeping — You Can Do Something About the "Whether" |
| Solving Drainage Problems at El Macero | How To Repair a Ball Mark |
| Fairway Renovation at Baltusrol | How to Seal a Leaking Pond |
| Fairway Renovation — It's Paying Off | Soil Testing Service offered by Mississippi State and the Green Section |
| Green Fairways but Dormant Turf | Better Drainage Through Slit Trenches |
| Firm Greens: Best for You and the Course | The Green Section Specifications for a Putting Green |
| A Guide for Green Committee Members | Enigma of Spring Dead Spot |
| The Green Section Visiting Service — Are You Getting Your Money's Worth? | Sulfur, The Essential Element |
| Bring Back the Grass | Systemics, A New Help in Pest Control |
| The Golf Course and Ecology | The Case for Temporary Greens |
| Grooming Your Golf Course is Important | Little Things Count in Tiling Golf Courses |
| Long Term Effects of Herbicides | Top-dress Greens and See the Difference |
| The Effects of Phenoxy Herbicides on the Physiology and Survival of Turfgrasses | The Golf Course Worker: Training and Direction |
| Automatic Irrigation and Conversion | Trees for Golf Course Use |
| Important Steps to Automatic Irrigation | The Troubles We've Seen |
| Let's Start with Irrigation Design | |
| Lessons Learned in Automatic Irrigation | |
| Designing Irrigation Systems for Golf Courses | |

TURF TWISTERS

BEST CONSTRUCTION

Question: Is the USGA now recommending more than one method of putting green construction? (Virginia)

Answer: No. The Green Section Specifications—released in 1961—are still the best method of putting green construction known today. When properly followed, greens built to the Specifications have performed exceedingly well over the past 10 years. A study is being supported by the Green Section this year (at Texas A & M) to review the Specifications in light of new ideas, improved techniques and field experience of the past decade. The results and any recommended changes will be brought to the attention of our readers in 1972.

WORTH A TRY

Question: Each summer we overseed common hulled bermudagrass onto our fairways. Invariably, much of it dies of winterkill and several areas are left weak and open to weeds. Our native bermuda survives very well. Why does this problem happen so consistently? (New Mexico)

Answer: Common bermudagrass contains many strains and varieties. Your native strain has adapted quite well to winter conditions. You should try to establish new seedling bermuda as early as temperatures will permit in the late spring. This will allow the new turf to become better established and harden off prior to cooler weather. Desiccation may also be a problem in higher altitudes and it may become necessary to irrigate during the winter if cold, dry conditions exist. If this fails to produce good turf, then sprigging or sodding with your native cold-tolerant bermuda should be worth a try.

FOR NATURAL LOOKING GREENS

Question: When greens are patched the new sod remains prominent seemingly forever. Is there any way to mask the fact that greens have been sodded? (Conn.)

Answer: Yes. Follow nature's example and try to make the sod appear to be one strain growing in a circular pattern. In other words, lay the sod in the usual square or rectangular pattern and then round off and match up the outside strips in order that the new patch appears to be one continuous circular patch growing naturally. Grasses never grow in a sharp square or rectangular pattern and so this is always a dead giveaway that the green has been patched.