



JANUARY 1973

USGA GREEN SECTION RECORD

A Publication on Turf Management
by the United States Golf Association





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Sand bunker
drainage is
important.

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This fairway will need a lot of expensive clearing before it is ready for play.

Spend Your Money Only Once

by William G. Buchanan, Eastern Agronomist, USGA Green Section

If agriculture is known for its high risks, hazards, and gambles, then golf course maintenance is rightly a part of it. To be successful, the golf course superintendent usually finds his summer weeks seven days long and his nights restless with wondering, "what will tomorrow bring?"

But there is usually more to it than the daily eccentricities of nature, man, or machine. Surprisingly enough, the superintendent's most serious, costly, and aggravating problems frequently could have been avoided if only the golf course had been properly built. Poor construction is doubly expensive, and, really, we need only spend our money once!

Building a golf course, or any part of one should be a very specialized procedure in these days of high construction costs. Unfortunately, this is not often the case. The illustrations you will find throughout this article are not the

exceptions to today's construction—they illustrate a general rule; unnecessary and costly mistakes are continually being made. There is an absolute wealth of practical experience available to anyone interested in better construction. And "better construction" does not necessarily mean "expensive construction." Anyone who has the desire and ability to combine today's technical and practical know-how, can build a good, technically sound golf course at a fair and honest price.

But there is more to it than merely "being aware" of today's scientific breakthroughs, or having practical experience. In so many cases we find a completed job unsatisfactory because someone failed to prepare a complete and accurate list of instructions and requirements outlining each construction operation. The specifications were either vague or worded so that the men responsible for doing the work

could not understand them.

Wording of specification sheets is of utmost importance. These specifications must clearly state the responsibilities of the architect, the contractor and the owner or his representative.

With this in mind, the following is offered as a good foundation on which construction can be started. Even if the job to be done is not an entire course, the following material may be used as a reference but on a much smaller scale.

Before any work is done, a contractor or builder with certain capabilities is needed. The contractor should also have a good set of specifications from the architect. Further, a good superintendent should be hired prior to construction. He will give valuable advice on what will be necessary for good maintenance later. I'm not saying the architects don't know their business; I'm saying the superintendent has **practical** knowledge and he is the one who has to earn a livelihood on the course **after** the contractor and architect are gone. There are many areas in which the superintendent's viewpoint deserves top billing:

1. Availability of water, both quantity and quality.
2. Can maintenance equipment get around the course and be used properly?
3. Are greens and tees large enough to accommodate anticipated traffic?
4. Are tees and greens located so runoff water from surrounding areas does not collect on them?
5. Can air circulate over the area so the grass can survive? (This is a main consideration often overlooked in the interest of a fancy design.)

The architect had this area planned for a fairway. Soil was deep gray clay, water is runoff after approximately four hours of rain the night before.



Water line was not backfilled properly. The fill has sunk now and the low area has to be refilled and seeded.

6. Design, location and drainage of sand bunkers—how this will affect the flow of traffic, mowing and the maintenance budget.
7. Would-be drainage of everything on the course—drainage of the subsurface under greens, bunkers, tees and fairways, and surface drainage of greens, tees, fairways and roughs.
8. Irrigation system—can it supply the water that is needed at the rates needed?



Once the property has been thoroughly analyzed and the architect's plans accepted, a contractor with the desired qualifications can be chosen. Here are some of the points that deserve attention, complete review and thorough understanding:

1. The contractor should have equipment and personnel to perform the construction, along with a performance bond to protect against a partially completed job.

2. Have contractor submit a list of estimates of quantities of all materials used for each separate area on the course, i.e., greens, tees, fairways, irrigation system and drain lines.

3. Bid submitted must have the cost broken down into each construction phase; clearing, rough grading, green and tee construction, irrigation system, drainage system, preparation of fairway and rough seedbed, fairway and rough seeding, seeding for greens and tees, and sand trap construction and filling.

4. Contractor agrees to a construction schedule which lists each construction phase (point No. 3) with a beginning date *and* completion date.

5. Contractor submit data on cost and time of completion of each phase of the construction work.

6. Architect and contractor are responsible for laying out and staking all areas in accordance with plans and drawings. Architect should be with contractor to ensure that the centers of all tees, fairways and greens are marked.

7. The contractor should have a limit on what time the course is to be planted, especially if a fall planting is planned.

8. The contractor must examine the proposed site prior to submission of the bid.

9. If the contractor has the responsibility to construct all pump houses, maintenance facilities and rain shelters on the property, he is responsible for adherence to building codes.

10. All soil-moving operations, soil-mixing operations, seedbed preparation and seedings are to be inspected and approved by owner or his representative before the operation is approved as completed.

11. The start and progress of any work is subject to the approval of the owner or his representative.

12. Upon completion of any phase, the owner or his representative is to be notified.

13. All debris shall be removed immediately upon completion of the job.

14. The contractor shall repair any damaged trees, shrubbery, turfed areas and/or utilities that are not included in the construction specifications.

15. Topsoil selected for use is subject to the approval of the architect and the owner or his representative. There must be enough topsoil provided to cover greens and tees to the depth specified in the specifications after settling. The topsoil may be stockpiled in convenient locations on the property but must not be handled when it contains a moisture level that would cause puddling or caking. The topsoil shall come from naturally well-drained areas. The percentage of silt and clay in the soil shall be determined by analysis by volume. The topsoil shall not contain any material that would harm plant growth or interfere with its preparation or maintenance.

16. When clearing the land, method of removing trees, stumps and roots should be stated. All stones one inch in diameter and above shall be removed. The method of disposal of trees, stumps, roots and other vegetation should be agreed upon. In many areas burning is no longer acceptable.

17. Soil mixing will be done off-site and will be done in accordance with the procedure stated in the specifications. (Before the specifications are written, all acceptable material available should be sent to a laboratory for complete analysis. There the proper mixture proportions will be determined.)

18. Fairways and roughs that have to be defined by the staking shall be plowed and disked to a depth of eight inches. All stones of one inch in diameter shall be removed. The basic fertilizer, herbicides and insecticides and lime shall be applied in accordance with the results of the soil analysis. Then the fairways



During construction the sand and topsoil were not mixed.

will have their final smoothing by harrow.

19. Only certified seed should be used. The type of seed and seed mixture will conform to the architect's specifications. All seed should be mixed and labeled to conform to state and federal regulations. The seed should be delivered in its original container. (Stolons should also be certified and of the variety and quality demanded in the specifications.)

20. Preparation of the subgrades of fairways, roughs, greens and tees is very important. The subgrades should be formed to the architect's specifications. Greens and tees should be elevated to conform with plans and firmed.

21. During subgrading, surface water should be directed away from greens and tees. Low depression areas should also be corrected at this time.

22. Following completion of subgrading, drainage lines should be installed. Drainage should be included on fairways, greens, tees and sand traps. Specifications should be written to include the method of laying the tile, type and size of tile, joint covering material, the trench depth and width, amount of fall to the opening, and an opening cover, and thickness of gravel cover over the tile.

23. Placement of topsoil on fairways where cuts have been made should be to a minimum depth of eight inches after settling.

24. Installation of the irrigation system on greens, tees and fairways is a very demanding operation. The specifications of an irrigation engineer must be followed. Any changes that are deemed necessary must be approved by the irrigation engineer and the owner or his representative. The changes must be then submitted to the architect in writing and a complete copy

of the "as built" drawings made available to the owner or his representative.

25. The contractor shall be responsible for the transportation of the pipe and all other parts from the point of delivery to the construction site.

26. All information as to size and type of pipe connections, wires, valves, fittings, risers and couplings should be tabulated.

27. The contractor is responsible for digging the trenches in the location and depth shown on the irrigation engineer's drawings.

28. Pipe should be laid according to the irrigation engineer's drawings. The pipe should be laid in a bed of fine gravel or sand to protect from rocks under and around the pipe.

29. The contract should contain a statement of how long the contractor is obligated to correct any leakage or any other malfunction because of faulty installation.

30. Sand traps will be finished as shown on the architect's plans as the greens are constructed.

31. Collars, fringe areas and approaches around greens are to have 10 inches of topsoil after settling and conform to the architect's drawings.

32. Topsoil shall be mixed by volume and conform to the specifications stated in the laboratory soil analysis.

34. All topsoil will be mixed off-site and transported to the green.

35. The finished grades will conform to the architect's plans.

36. Seeding rates and application of seed shall conform to specifications of the architect.

No specifications were written as to how deep topsoil mix should be on this green.

Irrigation lines and drainage need to be planned together. Here the drain line was laid, then the irrigation line cut through. The mistake was not corrected until a wet area developed.





When erosion started during construction, the area was not regraded; boards were placed to divert water. What happens when boards are eventually removed?

37. After seeding, the contractor shall be responsible for watering the turf until the completed job is accepted by owner or his representative.

38. Contractor will restore any area damaged or eroded until the completed job is accepted by owner or his representative.

39. It shall be the owner's responsibility to provide all necessary equipment to irrigate, mow, fertilize and top-dress or otherwise maintain the course until completion.

40. Owner or his representative shall be furnished with duplicate copies of invoices for any materials used on the construction project upon request.

The above steps will help on many construction projects to protect the buyer from many "built in" problems.

No matter how good the architect is or how good the contractor is, if sufficient money

to build the course properly is not available, then the course will always show it. There have been countless "great" golf courses designed on paper and even laid out, but there are few that have been realized. The design and layout does not show the soil that the course is built on nor does it show what is under the soil's surface. This is why it is so important to have someone present to protect the investment as the course is being built. Plenty of money can be spent, but all of it should be well spent. As soon as anyone involved with the construction of a course, whether owner, architect, or contractor, starts to cut corners, the course is in trouble. In a large percentage of cases, the amount of money "saved" in construction will be spent many times over in future years in either extra maintenance or reconstruction—most likely both. So in construction, why not "spend your money only once?"

Top dressing and leveling a fairway as it nears completion.



Are You Sure Your Course is Nematode-free?

by Dr. William M. Powell, University of Georgia

In order to answer this question, you must understand what nematodes are, what symptoms they cause on grasses, and how the diseases they cause can be recognized. Moreover, if nematodes are a problem in your course, you need to know what can be done.

Nematodes are very tiny, usually microscopic worm-like creatures which grow in all kinds of habitats, from ocean waters to the bodies of man and animals and tissues of higher plants (fig. 1). These latter types, called plant parasitic nematodes, are the forms that frequently become major factors in the production and maintenance of healthy turf. Nematodes that feed on grasses usually do so on the roots and thereby damage the plants by removing cell contents and by destroying root tissue. However, these pests must have living grass tissue in order to survive and reproduce. Thus, they rarely are guilty of killing their host plants. They simply reduce vigor, which results in yellowing and stunting of grass in scattered patterns over the planting (fig. 2 & 3). More often than not, their symptoms make for increased expenditures in terms of additional fertilizer and water in order to maintain attractive turf.

The author has had the good fortune over the past several years to be rather closely associated with James B. Moncrief, Director of the Southern Region of the USGA Green Section. This Association has afforded the opportunity to obtain nematode samples from some 250

golf clubs from 13 Eastern and Southeastern states. Since 1960, we have processed nearly 1,300 samples from golf greens and fairways from these areas. Table 1 shows the results of nematode assays on samples drawn during the 11-year period from 1961 to the present.

Table 1. Kinds and relative numbers of nematodes found in soil samples from golf courses over an 11-year period.

Nematode	Number of Samples	Percent of Occurrence
Ring	1,040	81.8
Spiral	691	54.4
Lesion	467	36.7
Lance	357	28.1
Stubby-root	340	26.8
Sting	262	20.6
Dagger	203	16.0
Stunt	161	12.7
Root-knot	124	9.8
Sheath	81	6.4
None	36	2.8
Total	1,271	

Obviously, most of the samples contained more than one type of nematode. In fact, samples sometimes contained as many as 10 different species of plant parasitic nematodes.

From this table it is clear that there are several different kinds of nematodes that are capable of parasitizing turfgrass. Any one of these can cause significant damage in a given situation if the populations reach sufficiently

Figure 1. Low magnification view of lesion nematode.

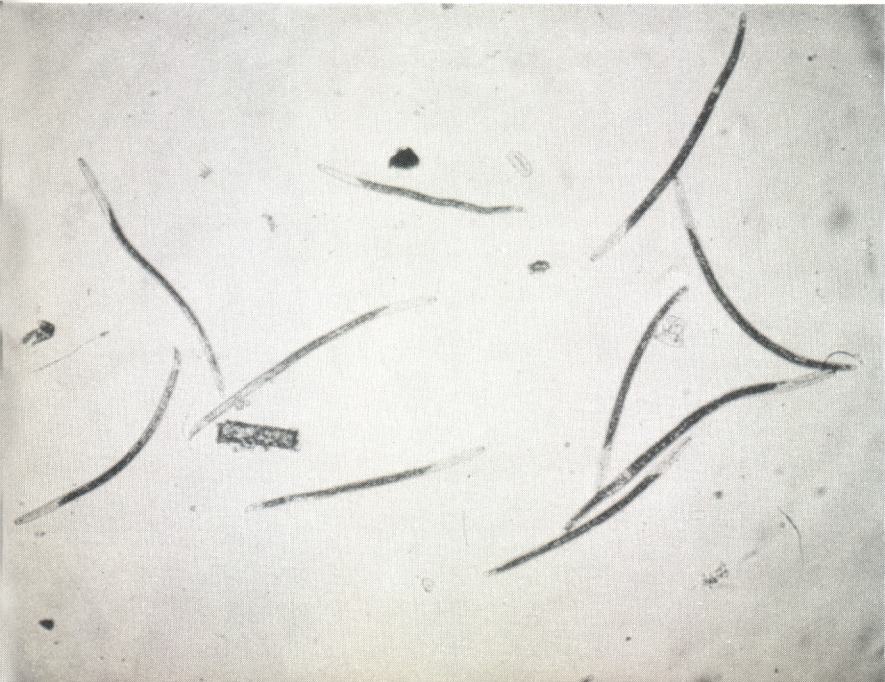


Figure 2. Typical symptoms



high levels. The ring nematode (*Criconemoides* spp.) is the type most frequently found in turf situations. This nematode is not as damaging as some of the others on an individual nematode basis, but it has a tremendous reproductive capability. Thus, it becomes a major problem because its populations tend to build up to very high levels and it is well adapted to a wide range of conditions. The lance nematode (*Hoplolaimus* spp.) is much more destructive than is the ring nematode. It is also widespread as a parasite on grasses and possesses a reasonably high reproductive rate. Lance nematode is probably the number one nematode threat to turf grasses in the Southeast.

The most devastating nematode on turf is the sting nematode (*Belonolaimus* spp.). This form is capable of destroying root systems of most turfgrasses (fig. 4). Fortunately, sting nematodes are limited somewhat by soil conditions in that they are able to survive best in the sandy soils and they can become problems on manufactured greens in areas where the natural soils are higher in clay content.

Root-knot nematodes (*Meloidogyne* spp.) are becoming increasingly important as parasites of turf grasses. This is the best known of all nematodes and is the primary pest of agronomic crops. This form causes swellings or galls on the roots of affected plants, hence the name root-knot nematode.

Lesion (*Pratylenchus* spp.) and stunt (*Tylenchorhynchus* spp.) nematodes are also important pests of various types of grasses. Populations of these types do not build up as rapidly as ring or root-knot nematodes, nor are they as damaging as lance or sting nematodes, but they are widely distributed and can be problems in many cases.

These six nematodes are probably the most economically important types. However, there are several additional forms that are damaging to grass in specific instances. Among these are stubby-root (*Trichodorus* spp.), dagger (*Xiphinema* spp.), sheath (*Hemicycliophora* spp.), awl (*Dolichodorus* spp.) and needle (*Longidorus* spp.) nematodes. Spiral (*Helicotylenchus* spp.) nematodes occur very frequently in association with grasses, but the damage done is very slight. Therefore, the spiral nematode is not considered as dangerous as most other forms.

Nematodes are damaging enough to grass when they are the only pests present in an area. Unfortunately, they are also well-known as factors in the so-called complex diseases. In this role, nematodes combine with fungi, bacteria, or even insects to intensify the amount of damage done to the plants. This means that population levels of nematodes that would probably be insignificant in themselves, become extremely damaging when other pathogens are present in the same area.

What can be done if nematodes are a problem, or if they become a problem on a particular golf course? The old axiom that prevention is easier than a cure is as true in this type disease as with any other, perhaps even more than with most others. Nematodes are spread from one area to another primarily on infected planting material or accompanying soil. Thus it is of primary importance to obtain planting stock from nurseries that realize the necessity of producing nematode-free turf. This is, of course, not an important consideration when seeded grasses are used.

It is equally important to make certain that nematodes are not a problem in an area where a new course is being developed or where renova-

of nematode damage.

Figure 3. Portion of fairway showing difference in nematocide treated strips vs. non-treated strips.





Figure 4. Roots of St. Augustine grass badly damaged by sting nematode.

tion is in progress. This can be done by taking soil samples from areas to be planted and having them assayed by some agency equipped to handle such samples. If plant parasitic nematodes are present, then these areas should be treated with a nematicide or a general purpose pesticide before grass is planted. Materials such as the D-D compounds, ethylene dibromide and Telone are suitable for use as preplant nematicides. Methyl bromide fumigants also are highly effective nematicides and give additional benefit through the control of fungi, insects and most weeds.

Control of nematode problems on existing turf is a more difficult problem. Again, samples should be drawn from suspect areas and assayed by competent personnel to determine if a nematode problem exists. Basically, there are two types of nematicides presently used to control nematodes on living turfgrass, and it should be emphasized that both give only temporary relief of the problem. One type is essentially a contact material that is applied on the surface and then drenched into the root zone with irrigation water. In using this type material, the effectiveness of the treatment is dependent on how well the material is distributed in the soil since such materials have very limited vapor action. Compounds such as Dasnit, Diazinon Mocap, and VC-13 are all used in this procedure.

The second type utilizes a volatile fumigant that is injected into the soil near the roots. With such materials, the vapor action is much greater than with contact materials although mechanical disturbance to the turf is greater. The dibromochloro-propane compounds (DBCP, Nemagon, Fumazone) are used in this type of

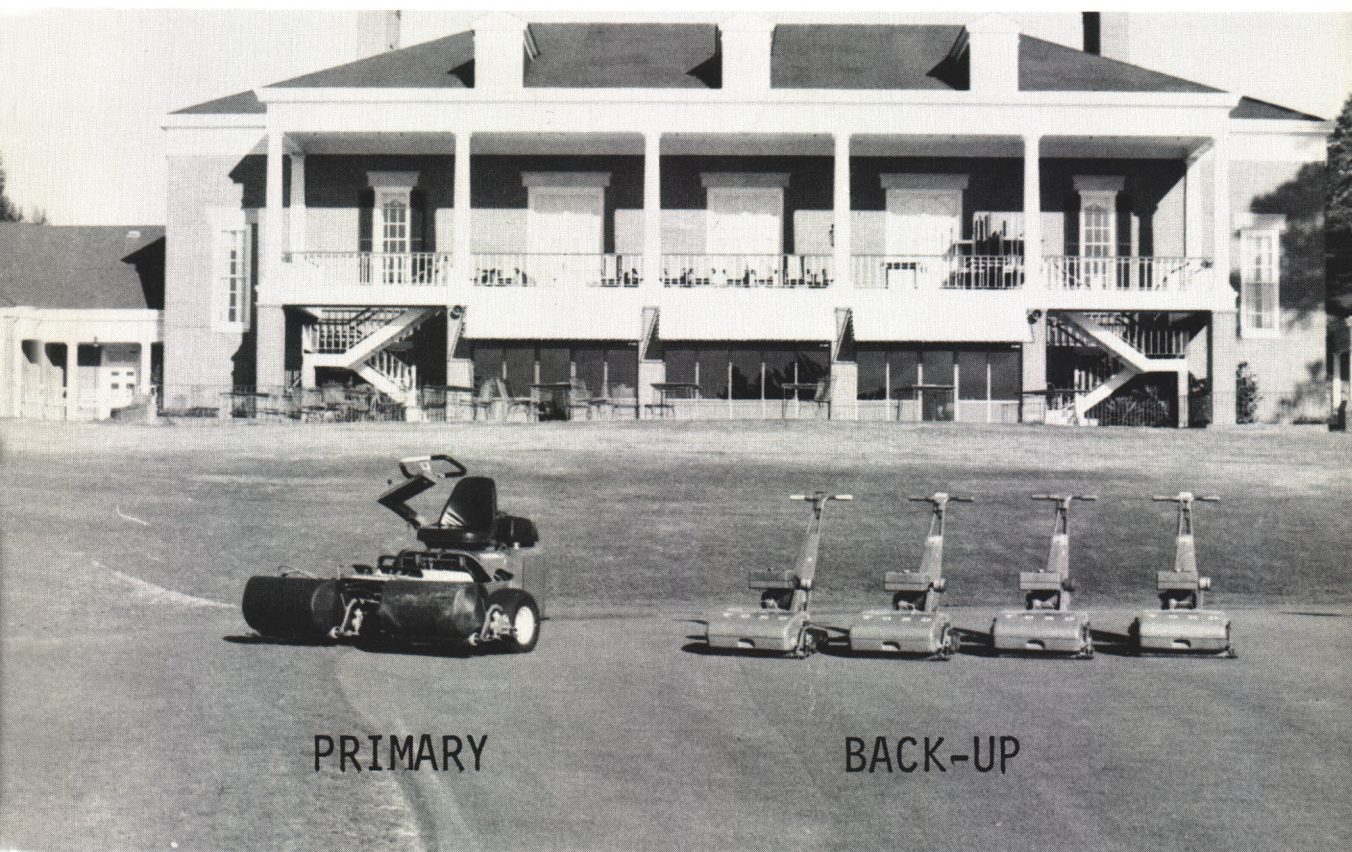
treatment. Fortunately, application equipment has been developed by several commercial operators which can inject these materials in turf areas with minimum disturbance to the grass. In fact, custom operators are available for the application of all the types of operations mentioned here.

Several factors need emphasis in summarizing our knowledge of nematode problems on golf courses. Plant parasitic nematodes are present in a high percentage of our golf courses and they are damaging the grass in these areas. Research has shown that proper site preparation and the use of nematode-free planting material gives much more satisfactory results than attempts to eliminate these pests after the grass is established. Finally, procedures are available that will reduce nematode populations on established grass. These procedures are beneficial through reduction in production costs as well as allowing for the maintenance of playable turf surfaces.

THE AUTHOR

William M. Powell is a native of Halifax, Va. He received his B.S. degree in agronomy from Virginia Polytechnical Institute, and his M.S. and Ph.D. in plant pathology from North Carolina State University. Powell joined the faculty of the department of plant pathology at the University of Georgia in 1960, and since then he has engaged in teaching and research in that capacity until the present time. His teaching responsibilities include both nematology and general plant pathology while his research has dealt primarily with nematode diseases of fruit and nut trees, ornamentals and turf.

Are Your "Back Up" Systems "Go!"?



by Maynard Brown, Jr., Superintendent, Idle Hour Golf & Country Club, Macon, Ga.

The space program is under fire from many quarters. People say it costs too much, we don't get enough benefits from it, and who wants to get to the moon anyway. There are far more pressing needs here on earth. I'm sure you have heard all these arguments and more, but agree or not, you have to admit that we have reaped much from the program, especially in the field of medicine and basic research. It has touched almost every facet of our life here on earth. It has even touched me here at my club in the sleepy little town of Macon, Ga. Here is how:

When I was sitting glued to my TV and radio during the abortive Apollo flight, praying every minute for the safe return of those

trouble-plagued astronauts, I was awed by the cool, efficient commands of Mission Control, telling the crew to use "back-up system so and so" because the primary system had failed. These "back-up systems" saved the lives of that Apollo crew. They are used on all space flights and, also, as you may not know, on all commercial aircraft we fly today. I thought about this some time later; it hit me that "back-up systems" might be incorporated into my maintenance program.

How often have you been in preparation for that big tournament and your new triplex greensmower malfunctions? Or your tee mower, or fairway mower, or tractor, or vertical mower or any other of a hundred pieces of equipment fail when you have a deadline to

finish a job? Could I possibly devise some back-up systems for this expensive maintenance equipment?

Now I don't have a big budget. I can't buy two or three of everything and just keep one in stock in case the other breaks down, but there must be some steps I could take.

For years when I bought new equipment, I would trade the old piece on the new to reduce the price. After all, this was a prudent business practice. But was it? Was I really so smart in trading in those old pieces of equipment? What would it really cost me to keep the old if it was worth repairing, and use it as a "back-up" system for my primary new equipment? It turned out to be surprisingly little.

Most suppliers don't want the old equipment anyway. You can probably get some direct discount and keep the old items just so he won't have to cart them into his shop. Often the new equipment is a labor saver and the machine or machines it replaces are still in good working order. Sure, you could get a pretty good price for a six-months-old walking greensmower, in good condition, but what is its value to *you* when that new triplex has broken an axle, or hose or cracks a ring at 6:30 a.m. mowing for that big tournament? It's worth *plenty* to me. So much so that I went in depth with this back-up program. Here is what I did.

First, when I obtained my new triplex greensmower, I kept all four of my walking mowers. Not just "kept" either. I made sure they were sharp, set at the same cutting height as my triplex, engines were in top operating order, and checked out each week. (See photo No. 1)

When I purchased my new larger triplex apron and tee mower, I kept my two small ones. They were performing well except that it took two men to do the job and only one with my new mover. They are also checked every week and are set at the same height as my new tee mower.

I did the same with my verti-cut units when I purchased my triplex vertical mowers. They were in excellent shape, and I could not recover enough from trading them to really make a dent in the cost of the new units. Actually, they were worth more (I had two) than the triplex units sold for. The supplier surely was not going to swap even.

My old gang mowers I repaired and kept to mow the range. In a pinch they could still be used on the fairways.

I kept one extra tractor. This took some convincing of the Green Committee, but it has proved its worth many times over. A used tractor has a good trade-in value or can be sold on the open market easily. I convinced the

Committee by turning this into a plus. After all, its value will depreciate little from now on, and we could sell it any time later if things got tight. They agreed.

My latest purchase was a utility vehicle mounted sprayer. I kept my old one just in case. It comes in handy, also, if you spot Pythium, to have two guns to fire.

Now this may not be new to some of you. Maybe you have been doing this all along. I am talking mainly to the low budget nine-hole, or low budget 18-hole superintendents. After all there are more of us than you rich guys. But our members are demanding the same ideal playing conditions that the more wealthy club members have grown to expect as ordinary.

Here are some closing tips on what I found to be helpful in setting up my back-up program:

1. Analyze the old piece of equipment. Is it worth keeping? Will it cost too much to fix? Do I have room to store it? Don't keep junk.
2. Have figures to present to the Green Committee or Board showing the value of this equipment to the course. One good argument is that it is usually paid for and depreciated out of your budget by now, so why give it away?
3. Don't keep it stuck in a corner and never checked out. If you don't have the mechanical help to keep old equipment ready to use, it would be better not to keep it at all.
4. Don't carry the system too deep. By this, I mean, when you get your next new equipment, phase out your old "back-up" system at that time. You will be the judge of this, of course, and you may want two back-up systems, but I have found it to be unnecessary in practice. They take up too much room, require too varied a parts inventory and require too much of my mechanic's time.

Don't get caught half-way to the moon in that next big tourney without a back-up system to get you home. Try it, you'll like it.

THE AUTHOR

Maynard Brown, Jr., has been the golf course superintendent at Idle Hour Golf & Country Club, Macon, Ga., since 1967. Earlier in his career he held positions as pro-superintendent-manager and pro-superintendent at other courses in Florida and Georgia. He is a Director of the Georgia GCSA and a member of the GCSAA. A graduate of Mercer University, he holds a degree in law.

June in January



Figure 1.

by Stanley J. Zontek, Eastern Agronomist, USGA Green Section

When we speak of course maintenance, mowing, aerations and topdressings principally come to mind. Oftentimes, with all this work to be done, another facet of course maintenance is overlooked. This is course landscaping and beautification. Basically, it involves turning an ugly, difficult-to-maintain area into an accent point of beauty, especially when the foliage is in bloom. Figure 1 is an example of this. In this case the natural and low-growing mountain laurel (*Kalmia latifolia*) has been planted on a steep bank looking out from a tee. It provides green color year-around and beautiful flowers in the spring. Once established, the heavy leaf cover chokes out competing weeds and small trees, leaving a picturesque minimum maintenance area.

An increasingly important use of landscape plantings is in traffic control. A strategic planting or flower bed can direct foot and cart traffic away from an important turf area. Figure 2 shows how a split rail fence with various spring and summer flowering shrubs planted along it has directed potentially damaging traffic from going over the tee to the cart path on the right. The resulting planting has improved the appearance of the area and hopefully relieved the tee from some needless wear and tear.

Figure 3 is another example of how a

planting can easily and beautifully direct the flow of traffic. Being strategically located at the fork of the cart path, the planting tends to keep the traffic on the roadway by eliminating the natural tendency of riders to strike out on their own. Such a planting has now made the area good looking and functional.

A little landscape planning can also clear up an eyesore and traffic problem. Previously the area in Figure 4 was a scarred mud spot worn by heavy foot traffic through a confined area. The installation of the fountain, crushed stone, curbing and some sod transformed the spot into a neat, smart-looking area that adds to the manicured look of the clubhouse grounds.

Perhaps the single most important purpose of course beautification is being overlooked. That is, the improvement in the appearance of the golf course. Flowers and flowering shrubs add color, beauty and charm. What better tonic is there in the spring than the sight of flowers in bloom after coming out of a bleak winter. Or, the sight of bright colorful flowers around the clubhouse when members and guests arrive. What better start to a round of golf than a path lined with flowers leading to the first tee (Figure 5). Out on the course, what better way to dress up a bridge crossing than with a flower and shrub planting. At the end of the round, colorful flowers add a sense of



Figure 2



Figure 3



Figure 4

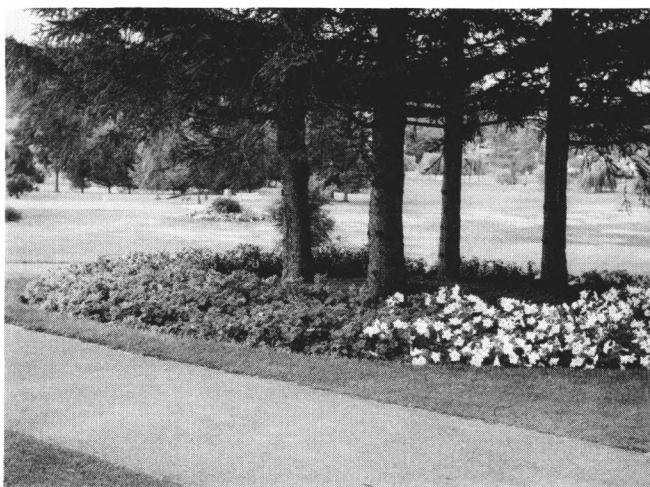


Figure 5

well-being to cheer the winners and lift the spirits of the losers. Flowers and landscaping can accomplish much.

One might say, "Well, I don't know very much about flowers and plantings. I'm an expert on growing grass, not flowers." But there are many experts available for help and service. These are your local nurserymen. Since *their* job is knowing what flowers look and do best under each circumstance, they would be most capable to help you set up a flower and planting program. In most instances the nurserymen have crews that do the actual planting. This saves labor, and in addition when the nurserymen do the work, the plants are usually guaranteed. County agents are also an excellent source of information on questions in horticulture.

The cost of a planting program can be surprisingly low. When bought in quantity, the cost per plant goes down rather sharply. This is especially true when annuals are used. In the case of flower bulbs, the relatively high initial

cost is offset by the fact that once planted, only a small amount of replacement bulbs are needed each year. Shrubs once purchased and planted last for many years providing good looks with minimal upkeep.

In conclusion, many things can be accomplished by a good course landscaping and beautification program. The membership especially the ladies, like and appreciate this type of work. Also, ugly, high maintenance eyesores can be transformed into colorful, picturesque accent points that add to the aesthetics of the course instead of detracting from it. Traffic patterns can more readily be controlled with maximum eye appeal. And finally, the course as a whole benefits. Flowers and ornamental plantings add immeasurably to the beauty and aesthetics of the golf course. It is one of the things that adds to the manicured appearance of the course that all superintendents desire. Start planning now, spring is just around the corner.

A TURF TIP FROM QUINTON:



Quinton Johnson, Superintendent at Brookhaven Country Club, Dallas, Texas believes top-dressing is important but the labor to shovel it from trailers or trucks into power spreaders is time consuming and costly. And so a power dump trailer was built in his maintenance shop. With the use of a front-end loader and two power spreaders, eighteen 5,500 square foot greens can be top-dressed with half the labor costs of previous methods. "It's been a great labor saver," Quinton reports.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

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I certify that the statements made by me above are correct and complete.
Robert Sommers, Managing Editor

TURF TWISTERS

YOU'RE SAFE

Question: Last fall we experienced an infestation of grubs. I immediately applied one of the popular and fast-acting insecticides, but the grubs were unaffected going into the winter. Is this unusual? Can I expect more grub activity in the spring? (Connecticut)

Answer: Insecticides do not penetrate deeply, seldom beyond the first inch; therefore, the material never reached the grubs. Next spring when they come up to feed, they will experience instant death as they eat their way to the surface. You're safe . . . the grubs only think they are!

DON'T SHUT OFF

Question: In our mild winter climate, our irrigation requirements are practically nil. Can we shut down the automatic irrigation system and save money? (California)

Answer: You can, but it isn't the best procedure under your conditions. As any other mechanism, the automatic system soon develops bugs if not used. Run it through a short but complete cycle once a week.

THE ARMADILLOS

Question: Recently, armadillos literally rooted up an edge of one fairway and rough. What can I do to get rid of them? (Florida)

Answer: In all probability they are eating grubs or mole crickets. Control the source of food and the animals will feed somewhere else.