



*Permitting grass to grow naturally at bunker's edge can save money.*

## REDESIGN *for Less Maintenance*

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**M**aintenance costs have been increasing at the rate of 8 per cent per year for the past seven years, putting pressure on the membership's ability to pay. Personally, I know of no course which has been entirely redesigned solely for the purpose of reducing maintenance, although I know of a few courses where the quality of turf was so bad and maintenance became so excessive that redesign became desirable. Redesign usually becomes necessary from one of several causes:

**First**, perhaps there was poor initial architectural design from a golfing standpoint or from an agronomy standpoint, creating bad golf holes or bad turf.

**Second**, poor construction practices might have caused poor drainage or bad soil conditions.

**Third**, there is obsolescence. Many courses were designed before high compression balls and the new lightweight steel shafts and swing-weighted clubs were developed, and the courses are, at least in the opinion of the members, too short and too easy.

The **fourth** cause of redesign of the golf course

might be strictly unrelated to golf. Sometimes the membership needs additional tennis courts, or the clubhouse needs to be expanded, or the parking area is too small, or a practice range is required. Occasionally the state or federal government decides the golf course is the ideal spot through which to run a four-lane or six-lane expressway.

In my opinion, the game is entering a critical stage, and the survival of the game for millions of people will depend on cost reductions. All clubs and golf courses need to take a good look at their own situations to see whether redesign would help them lower their maintenance costs and reduce the pressure to increase dues or fees. There is no sense in spending \$5,000 to change something which saves only \$200 per year in maintenance. If, however, the project will pay for itself in three to five years, it stands an excellent chance of being approved by management or the Board of Directors. Another factor entering into redesign is pride. Members want a better, stronger, or more beautiful course. If the high cost of maintenance of a golf course is necessitated by the desire of member-

ship to keep the course as beautiful as possible, or more challenging, or even difficult, then the payout period becomes secondary to esthetics. Unfortunately many good country club quality courses are being down-graded severely by practices which are supposed to reduce maintenance costs but which actually result in false economy. I refer in particular to the practice of letting the greens grow in, that is allow them to become smaller. The future costs of increased traffic in a smaller area and the resulting compaction of the greens often more than offsets the reduced maintenance costs of less mowing time, particularly with riding mowers.

Let's examine some of the factors contributing to high-maintenance costs and what might be done about it. Starting with the tees, some of the older courses and a few of the newer courses contain many small tees as opposed to one or two larger tees. As a result, mowing costs are increased by the necessity of having to transport the mower from one tee to the next as opposed to continuous mowing efficiency. Second, the slopes of the tees: Many tees in the old days were built when hand labor was still 30¢ an hour, or less, and the cost of maintaining a tee with side slopes of 2 to 1 was not too much of a problem. Slopes on the sides, fronts, and backs of tees should be kept to a minimum of 4 to 1, and a preferable slope of 6 to 1, so that mechanical equipment can be used and hand maintenance avoided.

The size of the tee itself can reduce maintenance. A tee which is too small receives too much wear and tear, forcing the need for re-seeding and top-dressing many times during the season. If a tee were larger, the natural regrowth of grass into a used area might be sufficient. Shade around the tees is also a factor. Members love to have the tees in a grove of trees where they can obtain protection from the sun in the summer as well as to give aesthetic values to the golf hole. But with the exceptions of certain shade tolerant grasses, trees often contribute to poor turf around the tees.

Now for the fairways. Many fairway problems begin when the course is constructed. It is absolutely necessary to provide a good seed-bed for good fairway turf. Modification of existing poor soil conditions will greatly reduce future maintenance. The same can be said for those areas which are low and which retain too much water. These spots must be well-drained if they are to take the normal traffic of a busy golf course.

The choice of the right grasses for the fairways is also important. Recent wear tests on northern grasses show that certain selections are more wear-resistant than others. If there is shade along the fairways, the use of certain fescues in a mixture of bluegrass or rye grass might save a lot of headaches and maintenance. In southern areas, the use of hybrid bermuda grasses can actually reduce maintenance by forming a dense turf which is relatively impervious to weed seeds as com-

pared with common bermuda. Common bermuda is very open in springtime due to its loss of leaf structure during winter play. Consequently weed seeds are able to reach the earth where they germinate more easily, increasing herbicide costs. This is quite obvious on courses which have large spots of hybrid bermudas and common bermuda side-by-side.

Correct watering of the fairways is another means of reducing the maintenance costs. Careful watering, particularly with automation, can greatly reduce maintenance costs of fairways.

In hilly areas, some slopes are so steep that erosion becomes a problem each year. The use of proper diversion terraces, particularly those which can be landscaped out so that they don't appear to be engineered ditches, are quite helpful in avoiding such erosion maintenance. In fact, it is possible to divert entire water sheds, if it is done legally.

Greens, of course, occupy a major part of the maintenance budget. In general, the maintenance costs of greens is in direct proportion to the area of the green. But if the greens are too small, the wear and tear concentrated in the middle of the greens will soon cause the maintenance costs to exceed those of a green which is larger. You might call this the "law of diminishing backspin."

There is no question in my mind, based on my 20 years of experience, that building greens according to the USGA specifications will reduce maintenance costs. The balance of factors achieved in a USGA specification green are such that watering can be minimized, application of fungicides can be minimized, application of fertilizer can be optimized, and future problems of compaction, aeration, etc., virtually eliminated. The only trouble with the USGA type greens is that not enough people believe in it. Too many club members, who become overnight experts, believe that the seed-bed mixture is "too sandy—it won't grow anything. We've got to strengthen it by adding topsoil." This is often done, over the objections of the knowledgeable superintendent. A few years later, the green gets hard, crusty, and won't hold shots. Then somebody gets the idea that the way to improve the quality of the green is to add sand. So they add sand, and the death of the green begins. As most of you already know, stratification is the No. 1 "No-No" in greens construction and maintenance.

If you are still watering your greens by hand, I urge that you automate as quickly as possible, even if you can't afford to automate the fairways. Good greens watering is essential to good greens and lower maintenance costs. Good quality labor to water the greens at night is fast disappearing. It isn't even a question of payout; it is the question of "where are you going to find people who will even water at night?" We think automation is essential.

Since the greens are watered regularly, it is necessary for the bunkers next to the greens to be so constructed that the water will not run off the



*Maintaining grass on a gradual slope can save hand-mowing and hand-raking costs.*

greens into the bunkers and thus create added maintenance costs. This is one place where the expression "don't give me any lip" does not apply. Another place it is possible to save money is by the elimination of bunker edging by the use of existing or special grasses to form the lip of the trap. And remember, it's not just the cost of cutting the lips; it's also the cost of replacing dirty sand occasioned by the soil's washing from the lip into the bunker whenever you water your greens. The use of riding bunker rakes is another must in reducing maintenance. Therefore bunkers have to be designed so that 90 to 95 per cent or more of the area can be so raked. This means redesigning the radii of curvature and the slopes.

Edges next to bunkers are responsible for high maintenance costs. This is often caused by a trap which is too large and which forces the player to walk along a line immediately next to the bunker when the player goes to the next tee. Perhaps cutting the bunker in two and making a large pathway for golfers in between will help. But if you can't help it, these problem areas should receive a seed-bed material almost as good as that used on the greens. Sometimes the greens are barely large enough to accommodate the necessary hole placements and the traps are very close. If the green cannot be reduced in size to allow a collar of at least five feet, perhaps the traps can be moved a little farther out. This would reduce the wear and tear on the periphery of the green occasioned by the riding mowers. Check also to see if you have too many trees or too much shade on your greens, increasing the necessity of fungicides, aeration, etc. Good air drainage is just as important as good sub-drainage.

Sand bunkers of all sorts cost money to build and they cost money to maintain. Some superintendents advise that it costs from \$50 to \$150 per year to maintain a bunker. If you have 80 to 100 on your course, this becomes a substantial item. The Club and its architect should first take a good look at reducing the number of bunkers, particularly those that are only in the way of the average golfer and do not necessarily hinder the low-handicap golfer. I'll have to admit that there is hardly anything prettier on a golf course than dark green grass and white sand, particularly in irregular patterns. If the object of your program in redesigning your greens or course is to make beautiful pictures for the magazines, then I suggest you use big long bunkers from tee to green or extending 30 to 40 yards out in front of the greens. These will make beautiful pictures; particularly if you take them from an airplane. But they make expensive golf courses and slow play. If the bunker is designed properly it will not be cut so steeply that either the golfer can't take his stance, or the sand is beyond its natural angle of repose where it will slough at the slightest movement of wind, water, or vibration.

Personally, I believe that any course which has more than 50 or 60 traps is probably over-trapped, and the course should have a study made to determine whether unnecessary bunkers can be eliminated. There is also the possibility of creating grass bunkers instead of sand traps; and as any player will tell you, high grass is much tougher to recover from than a sand bunker. In the fairway areas, I prefer to use "tree traps" instead of sand traps, except for the "picture holes."

On this subject of bunkers, I would like to make



a statement which is about as profound as can be made where golf courses are concerned: There is usually no agreement between a superintendent and a golf course architect when it comes to traps. The superintendent wants a bunker which is so shaped that it's very easy to mow around. The architect, in trying to please the membership, has to design what are often referred to as "character" traps with all the little "walk-outs" or "tongues" and irregular shapes reminiscent of the old Scottish courses or links, but universally used where the "pretty picture" impulse is predominant. So, if you want "character" bunkers you'd better be prepared to pay for the maintenance. But here again, the use of slow-growing grasses will permit a greatly reduced mowing program for these hard-to-reach areas.

Even the roughs need to be examined for their effect on maintenance. Sometimes in an effort to reduce initial costs, too many trees are left in the rough and it's impossible to mow the roughs with riding equipment. I suggest that a study of the roughs be undertaken so that eventually no tree is closer than 15 to 20 feet from its neighbor, thus permitting mechanized equipment to cut the grass. And high maintenance shrubs and trees which produce suckers, such as Japanest ligustrum, or certain privet hedges in the south, or those bushes which have to be pruned often to be controlled, probably ought to be eliminated.

Last, but not least, examine your watering system. Remember, water costs money, whether

you buy it from a city or pump it from a well or obtain it from a lake. And you have to pay for the electricity to run your pumps. Therefore, saving of water and saving of electricity or fuel should be paramount. Anyone who has tried to handle a manual watering system knows that sooner or later over-watering with run-off will occur.

I'd like to sum up by stating that although some of these problems are common to all golf courses, each golf course and club is an individual. It not only has its own problems of soil, slope, design, etc., but it also has its individual membership, and each membership might have different requirements or standards of quality. Therefore, each course must be considered separately, and an objective long range program of improvement should be made by a qualified golf course architect to obtain the best results. I say a qualified architect because it is impossible to separate any change on the course from esthetic values or playability. Except for rather routine or minor changes, this work should never be done either by members or golf professionals or by course superintendents, no matter how well-meaning. Although we have great respect for these gentlemen and the jobs they do, most of them are not qualified to evaluate the inter-relationship of the sight values and shot values with the agronomy they seek. Their advice is valuable, but major changes are a job for the professional golf course architect. We believe that if you are real sick, you ought to get the best doctor available.

