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ClubCar

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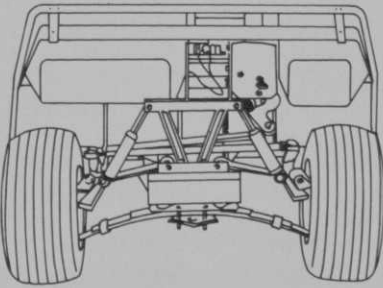
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Presenting the golf car of the 80's, the golf car created by the golfing industry. Here are the features you asked for, and much more. Classic styling, improved economy, durability and greater value make the Club Car DS the best golf car investment you can make.

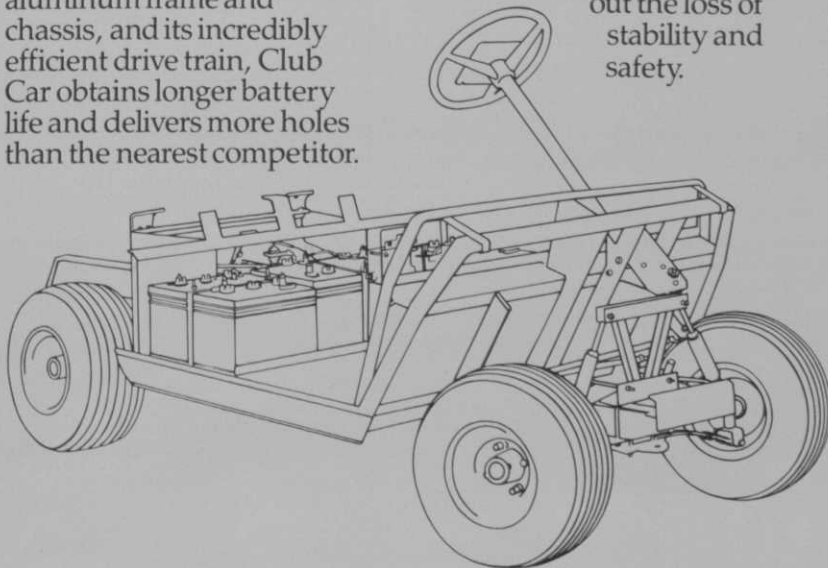
Longer Battery Life

The Club Car DS's lighter weight and improved drive train gives more holes of golf per charge. Less energy use per round means longer battery life.



Lower Operating Cost

With its lightweight, all-aluminum frame and chassis, and its incredibly efficient drive train, Club Car obtains longer battery life and delivers more holes than the nearest competitor.



More Comfortable Ride

The Club Car DS has our trademark "Total Balance" suspension system, longer rear leaf springs and shocks on all four wheels. The rear tread is 2 inches wider, the center of gravity is lower. It's the best ride and the safest car produced.

Reduced Weight

The DS has combined durable, lightweight materials in its aluminum frame and fiberglass body, making the Model DS the lightest and strongest golf car in the industry.

Totally Rust-Free

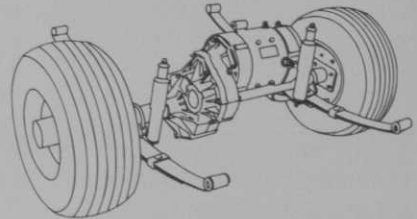
Club Car Inc. is the only golf car manufacturer to combine rust-free materials as an aluminum chassis, frame and floorboard with high impact fiberglass body.

Sharper Turning Radius

The turning radius on our four wheel DS can match any three or four wheeler on the market without the loss of stability and safety.

Passenger Comfort

Club Car DS has the widest bench seat in the market. The wider bench with separate fully adjustable seat backs gives maximum individual passenger comfort.



Body Protection

The new attractive styling was designed to minimize body damage. Front and rear bumpers combined with rubber side rails offer all around body protection.

Highest Trade-in Value

The new Club Car DS is the most durable golf car in production today. The rust-proof aluminum frame and trim, fiberglass body, chassis engineered with rubber bumpers and side rails, and increased drive train life, combined to guarantee longer, damage-free operating efficiency. This results in the highest trade-in value available.

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good. If the bedknives loosen up, it allows larger debris to go between the blade and bedknife and causes nicks. If they are too close, heat builds up and ruins the edge.

Important tips to remember: Run the reel until normal operating temperature is reached, before setting. If set cold, friction will expand the metal and then they may be too close. If the grass is light, or it is extremely hot weather, check often. Grass provides the lubricant for reel to bedknife contact. Don't let the reels run when you're not actually mowing.

When to replace?

The annual cost of operating a mower is a significant part of the golf business. A conscientious manager must evaluate costs for various mowing jobs and take every reasonable step to reduce them. A good rule of thumb is to explore replacement when it looks as if operating, maintenance and downtime costs are going to exceed the replacement cost for a mower.

Individual situations bear a role in replacement. If there is a back-up unit, downtime would not be as dear as if there were none, and the turf just didn't get mowed when the mower is broke.

To determine when a mower has reached the end of its economic life, you must first determine the weighted annual cost. When cumulative repair and depreciation exceed this figure, the end has arrived. To calculate weighted annual cost, you must add the annual depreciation, which is the purchase price minus the salvage value divided by the expected life span. Add the annual cost of all repairs and the estimated replacement cost, then divide

by the number of years since original purchase.

Purchase price

The cost of a mower is a reflection of many variables. The manufacturer's price is based upon the cost of production plus the cost of marketing, plus the profit margin on producing and marketing the piece of equipment. The cost of production includes the rapidly rising cost of raw materials, labor and overhead. Just as your electricity bill is rising, so is the manufacturer's and the distributor's. Both must be passed on for each to maintain a static profit, which is actually a loss, due to inflation. The price goes even higher as the manufacturer tries to cope with inflation.

You're spending a lot of money, granted. But you have to mow the course. To get the best price, you might consider competitive bidding. There are a couple of things to watch out for. Beware of underbidding. If it is an inferior product, or does not have service behind it, you might end up paying much more than the price difference between it and a top-of-the-line mower.

Do not automatically purchase at the lowest bid. Consider the difference between price and cost. Price is what you pay to get the mower out the door. Cost reflects the total expense of owning, operating and maintaining the mower over the period of its useful life. Consider reliability (downtime), versatility, capacity (acres mowed/hour), and durability (longevity).

Philosophies

Most manufacturers and distributors view their operation with a biased eye. This pride in the equipment that they manufacture and sell,

and the service behind it, brings you, the customer, back for service, parts, and replacement and makes you feel good about it. This pride in maintaining a reputation has made many bitter over government interference. A good reputation can lead to success, however, there is over-regulation by the government, leading consumers to think that they are protected no matter where or what they buy. Simply not true, but the majority is being penalized by the evil of a few.

It has been estimated that direct government regulation has increased costs by at least 30 percent over the last five years. The plus is that the workplace and equipment are safer, the minus is that the end product cost more.

Most equipment manufacturers support a research and development department. Over the last five years, the majority of this department's time has been spent coping with government regulations, designing safety features into both workplace equipment and end products. What's wrong with safer? Nothing except that it costs.

We don't advocate making a lath operator stand on one foot, blindfolded, but we don't think you should have to pay a higher price for a piece of equipment because of the labor involved in moving fire extinguishers up or down the wall when all that matters is that they are there, they are within reach and they work.

Every manufacturer that I have ever talked to has told me that if a customer is having a problem with a piece of equipment, he isn't getting to the guy who can solve the problem. No manufacturer wants a piece of equipment out there doing a bad job. Reputation and service are the roots of their business. **GB**



and chemical costs. He was also seeking to create a playing surface that would be well-suited to his membership's golfing needs while standing up well under the stress of heavy traffic.

"Since we were faced with such a severe poa infestation, we needed to replace all the turf. But, we also wanted to choose a method that would eliminate the poa without closing the course to play. Roundup allowed us to fulfill both obligations," says Portz, noting that the existing bluegrass was controlled by spraying Roundup on the first nine holes, followed by a similar application on the second nine. This allowed the course to remain partially open during the two half days of herbicide treatments.

"If we had chosen to plow the course under, we would have had to close the course," notes Portz. "That would have been totally unacceptable to our membership. With Roundup, we got good renovation results, while still providing a suitable playing surface, even if it was dead grass for the beginning of the 1979 season."

A World Of Difference

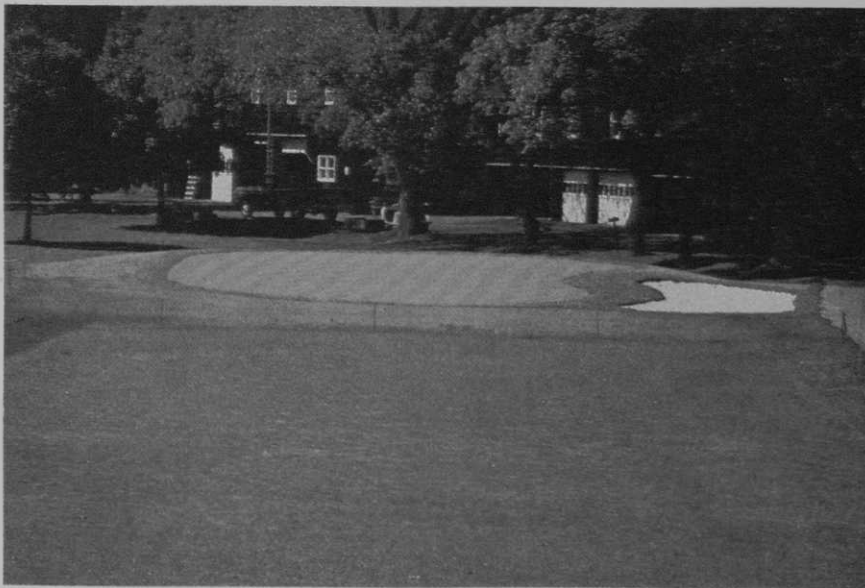
Realizing that total eradication of poa is impossible, Dave aimed his sights at a significant change in population rather than a 100 percent turn around. He now reports that more than 80 percent of his course is a perennial bluegrass/ryegrass combination, and less than 20-percent is infested with poa annua.

"While it may sound like we still have a poa problem, we couldn't be happier with this split," contends Portz. "The poa is scattered throughout the perennial bluegrass and because it is blended throughout the stand, we no longer have to do excessive watering during the stressful months of July and August."

To prevent the spread of the remaining poa, Portz has implemented a strong tactic, literally



The fairway leading up to number 10 green illustrates how successful the renovation was.



A new green was part of the renovation.

shutting off the water and irrigating only when absolutely necessary. "The perennial bluegrass/ryegrass combination can take the stress, but the poa can't," he observes. "Less irrigation has really helped to eliminate much of the poa that still remains, while also cutting watering costs substantially."

This strategy of cutting the number of waterings during the summer months proved doubly cost effective this year. Most of southeastern Pennsylvania was stricken with a record-

breaking drought that left the area 10½ inches below normal in average annual rainfall.

Normally, a drought of this magnitude would be a major concern to Portz since the poa would require three to four waterings a week in addition to daily syringing. "Watering a poa course in a situation like this only compounds the problem," he says, adding that while the course may look green, the risk of insect damage and disease is greatly

Continues on page 36

promoted to business director for specialty agricultural products in the specialty chemicals division of **Mallinckrodt**. Clifford joined Mallinckrodt in 1965 and has held a variety of sales and marketing positions in the specialty chemicals division.

Mike Cooper has been appointed

as sales manager for **Oseco Inc.** and will be responsible for directing marketing and sales of turf seed, among others, throughout Canada. Mike will work from the head office in Brampton, Ontario.

The **National Golf Foundation** has two revisions of two major golf planning manuals, **Planning and**

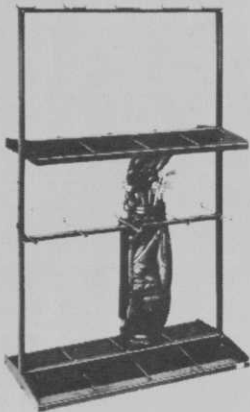
Building the Golf Course and **Planning the Golf Clubhouse**. A new 16mm motion picture, **Women's Golf Has Come a Long Way**, has been produced in cooperation with the PGA and LPGA. *Planning and Building the Golf Course* is \$7.95, *Planning the Golf Clubhouse* is \$25, available from NGF, 200 Castlewood Dr., North Plam Beach, FL 33408. The film is available from NGF for \$175, or may be rented from Film Comm, 108 West Grand Ave., Chicago, IL 60610, for \$15 for two days.

The Northern California Turfgrass Council has released a publication entitled **How to Save Water Sensibly**. The material was compiled by **A.C. Chet Sarsfield**, Irrigation Technical Services in Lafayette, California, and is presented as "a compilation and summary of information gathered through experience gained to date in actually dealing with rationing programs already in effect." The 10-page publication is available for \$1.00 from NCTC, P.O. Box 268, Lafayette, CA 94549.

The **TAES Consolidated Progress Report of Texas Turfgrass Research—1979-80** is now available for distribution. The 96-page report contains a summary of turfgrass research activities by 19 turfgrass researchers at the College Station, Dallas and El Paso extension centers. Copies may be obtained from **Dr. J.B. Beard**, Department of Soil & Crop Sciences, Texas A&M University, College Station, TX 77843.

The **Ohio Turfgrass Research Field Day** is August 4 at the Ohio State University Turfgrass Research Field Facility in Columbus. For information, contact **Dr. Keith J. Karnok**, 1827 Neil Avenue, Columbus, OH 43210, or phone 614/422-2591.

The **Clemson University Turfgrass Field Day and Trade Show** is being held August 6. Tours and discussion are planned from 8 until 4 pm. For information, contact **Dr. A.R. Mazur**, Department of Horticulture, Clemson University, Clemson, SC 29631, or phone 803/656-3404.



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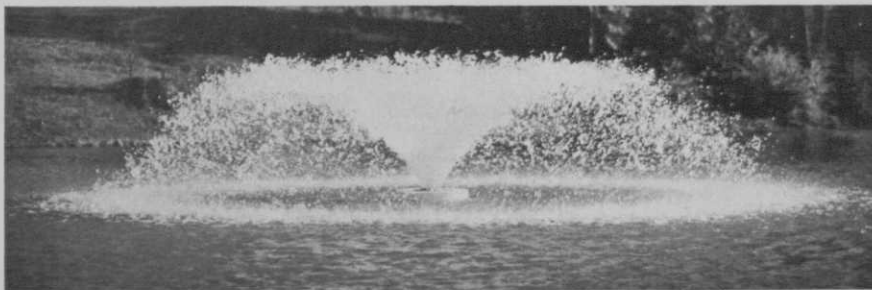
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foliage) and multiplied to such an extent that upward movement of water and nutrients was impeded by their presence. Wilt symptoms and the presence of bacteria in xylem cells prompted us to name the disease "bacterial wilt" of 'Toronto' creeping bentgrass. Bacteria were not found in any apparently healthy plants (Fig. 6).

The bacteria associated with diseased 'Toronto' resembles certain rickettsia-like bacteria in size, morphology and location within the infected plant. Pierce's disease of grapevines, phony peach disease, alfalfa dwarf and almond leaf scorch are some diseases caused by rickettsia-like bacteria.

Because the commonly used fungicides were ineffective on Butler National's 'Toronto' greens, it is our feeling that the bentgrass diseases, red leaf spot, crown root rot, and low temperature *Pythium* were of minor importance in June of 1980. The discovery of bacteria in wilting 'Toronto' creeping bentgrass strongly suggests a solution to the mystery disease that devastated 'Toronto' greens of Butler National. In addition, this bacterial disease may represent a significant breakthrough in the unsolved "C-15 problem" which has plagued numerous 'Toronto' greens in the Midwest for many years. Red leaf spot, crown and root rot and this newly discovered bacterial problem may have even been confused one for the other throughout the years.

Several different bacteria have been isolated from diseased plants in high frequency (Fig. 7). Some success has been achieved in demonstrating their pathogenicities, however, not with consistent results. Efforts are continuing in our laboratory to work with the bacterium which was observed in diseased 'Toronto' plants.

Bactericide control experiments will be continued from last Fall in the Chicago area. Copper fungicides and antibiotics which give bacterial disease control on other cultivated crops will be tested on 'Toronto'.

Since this is the first reported bacterial disease of turfgrass, its importance cannot be overemphasized. Research on 'Toronto' bacterial wilt will enable turfgrass specialists to combat new or already existing bacterial diseases which are undoubtedly out there, but attributed to other pathogens or physiological disorders... as the C-15 mystery has been for quite a few years. GB

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One goal might be to make the water look as if it is the work of nature.

Water on the course can be functional and beautiful

By J.A. French and R.P. Korbobo

Water in the landscape has a magical quality. Everything else being equal, an area or vista that has water as a part of it will always be more pleasing than one without it.

A sunrise or a sunset is a sight to behold but it is so much more dramatic if it is also reflected in a body of water. Standing close to a thundering waterfall is tremendously exhilarating. It fires us up. Sitting by a small stream of clear water moving so smoothly and quietly over its sand and pebble streambed is soothing to our souls.

Just sitting along the edge of any sizeable body of water is relaxing and inspiring at the same time.

We feel that a golf course with water on it is far more capable of having dramatic holes built into it than a course with no such advantage. Many competent golf course architects seize upon "swamps, mudholes, or high water tables" as golden opportunities rather than as obstacles. (The famous Gardens of Versailles in France were designed in a huge swamp area. The landscape architects utilized

"negative features" and turned them into stunning gardens using water as a plus feature in the final design.) Therefore, any body of water no matter what size on (or sometimes off) a golf course, should not only add a challenge and excitement to the game, but also an opportunity to add unusual beauty to the course as well.

The most common types of water on a course are ponds and streams. The less common but even more spectacular are lakes, inlets, bays, and oceans!

A pond or stream cutting all the way across the fairway usually means one of two decisions for the golfers: either they try to "carry it" or they are forced to "lay up" before they attempt to hit the ball to the far side. Placing any type of plants for landscape purposes near these bodies of water must never interfere with a properly hit ball. The ultimate size of any newly planted trees must be taken into account. They may not hinder a good shot off the tee now but where will the branches be on that same tree forty, fifty, or more years in the future?

We can almost say as a rule of thumb, "Never plant any wood plants along such water hazards in the areas covered by the cut fairway." When we speak of "woody" plants we mean those that grow larger each year. This includes all trees and shrubs plus a few creeping or rambling plants.

However, "groundcover" plants could be an exception to this rule. In unusual circumstances, the slopes leading to the water's edge may be too steep or rocky to have it covered with the usual fairway turf. In order to prevent erosion (and an ugly eyesore) such ground cover plants are often employed even though they are technically speaking "woody" plants. They stay so close to the ground, however, that they would not interfere with a properly hit airborne ball.

Such plants as cotoneaster, prostrate roses, dwarf sumac, and deep



growing vines such as crown vetch and honeysuckle can be effective in such locations. They not only soften the appearance of a bad slope, but their roots spread to prevent erosion of soil. A safe choice is always to use the plants already growing natively in the area.

On most water sites when considering trees, we first look for those trees usually associated with water, both aesthetically and horticulturally. The weeping and other type willows, red and silver maples, sweetgums, sourgums, pin oaks, box elders and ash trees are typical horticultural examples of trees found naturally at the water's edge. An outstanding tree found near and in water sites is the bald-cypress (*Taxodium distichum*) which grows in the Gulf and Southeastern states.

Smaller trees or shrubs would include alders, a few viburnums, the shrub dogwoods, American hornbeam, spicebush, hardhack, and some of the hollies. If your course borders brackish waters along the coastal areas then you will find the shrub groundselbush (*Baccaris halimifolia*) a big help. Very few of the introduced commercially grown plants will thrive in such locations so any native plant is very welcome.

In almost every instance, the trees used for landscape effects will be planted well into the rough on either or both sides of the fairway. Since useful function is as important as the design, we look to see if there are any areas that might need to be screened out of view, such as pump houses or pumping equipment, concrete shorelines to prevent erosion, unsightly buildings, roads, etc.

After such problems are dealt with, careful selection and location of trees or shrubs is then made to give the water hazards all the dramatic qualities possible. Man-made ponds are costly to construct, so we must make the most of them. Let us make them beautiful.

Perhaps the first goal would be to make the body of water look like it had been there as a work of nature. Too many man-made water holes just sit there looking like some monstrous puddle after a heavy rain. With a few well-placed shrubs (mostly native to the area) and some trees and (if needed) altered contours, we can usually conceal the fact that this pond was created by bulldozers and engineers.

Before the trees and perhaps smaller plants are placed, the basic

shape of the pond should be inspected. If it is to look natural, it should not be a perfect circle or symmetrical in any way. A natural effect is achieved by meandering edges and flowing lines.

Also the banks of the pond should be constructed (retained) with a material which can support natural growth if possible. Where the water's edge meets the soil, there should be a natural intermediate area where "typical bank plants" can grow, grasses, sedges, wild iris, etc.

Should a pond already have what amounts to small peninsulas or promontories built into it, just take a few seconds someday and imagine a lone tree out there with its reflection in the water. A few classic examples would be a weeping Japanese flowering cherry tree, a weeping Japanese maple (especially if it were a red-leafed form), Japanese black pine or even a treeform wisteria! That's all it would take to turn a common waterhole into an area of beauty.

When a natural outline is achieved, then lower growing shrubs can be planted only a few feet from the water's edge. They will then be able to grow into gracefully arched forms so the branches will actually make contact with the water. When selecting these plants keep all seasons of play in mind. Will they have conspicuous flowers when in bloom? What color will the foliage be during the fall season? Will the branching habit, minus its leaves during dormancy, be attractive? Also, how much care will they demand during the course of their lifetimes?

Some plants are designated by the landscape profession as "interesting". This means they are a pleasure to look at during all four seasons of the year. The dogwood tree, highbush blueberry and the sourgum are three fine examples of such plants. If the choice is there to be made then, of course, we select the ones that have the most attractive features for all seasons of the year.

choice is there to be made then, of course, we select the ones that have the most attractive features for all seasons of the year.

Reflections of the larger trees can be dramatic due to their size and structure alone. Conspicuous flowers are really not that important on these plants. Their branching habit and the fall color, however,

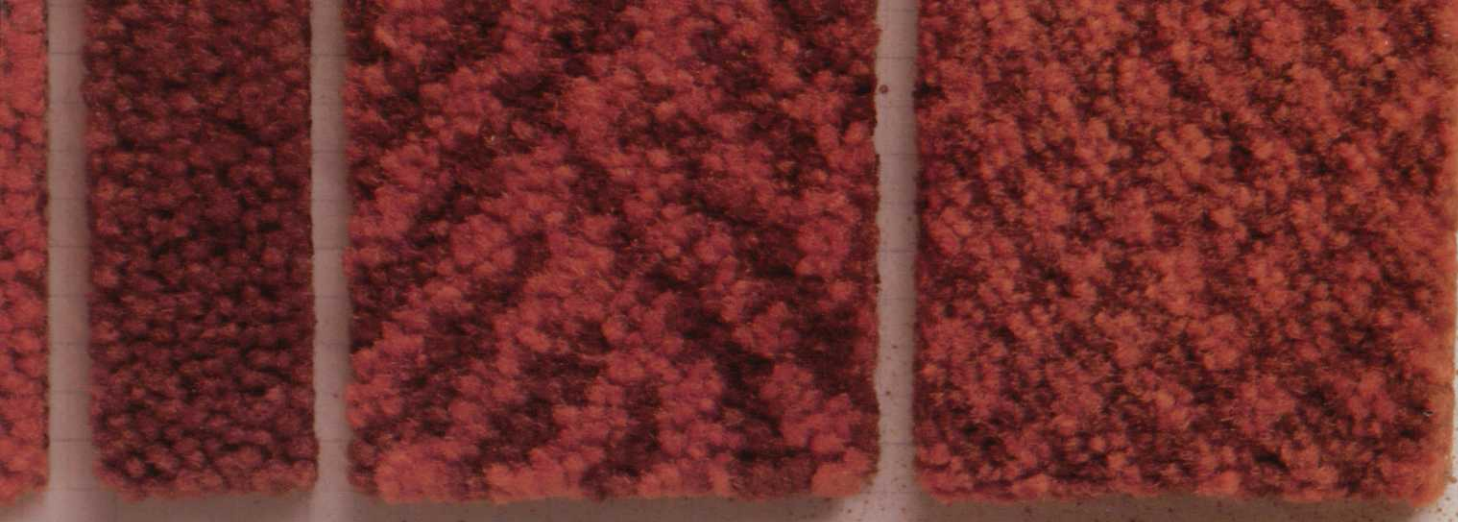
can make a great difference when it comes to the final choice. Those trees with very refined foliage, such as the honeylocust, and Chinese scholartree (*Sophora*) and the willows, give an extremely delicate reflection on a still body of water. (See picture 1). It is even more spectacular if such a reflection has the white, puffy cumulus clouds in it. Thin foliated trees such as the above will allow you to see right through the tree up to the blue and white sky for a more theatrical scene. Such sights or scenes of beauty sometimes catch the attention of even the golfer who is having a bad day! In fact, this type of beauty on a golf course can very often calm down an irate golfer in time to get back on his game. Conversely, to see the reflection of a huge beech tree in the same situation would have the effect of strength built into the picture. However, if it were a copper beech, then perhaps the color of the reflected image would be the dominant characteristic of the picture.

There are those trees whose conspicuous bark alone would put them on the list of preferred trees. Picture a grove of grey or white birch backed up with some dark green hemlocks looking back at you from a still pond! That would be a picture at any season of the year.

Such reflections may be seen from any point just so the water is between you and the plants. While on the putting surface waiting your turn to putt, you very frequently find yourself looking back toward the tee. In such situations, you may even plant trees behind or on the sides of the tee to create a mirror image in a pond from your vantage point on the green.

The possibilities are endless — especially on a course that has numerous bodies of water. It is a good practice to work these landscape pictures out on the site as well as back on the drawing board. Working with a party of two, you can be sure of the resulting reflections. One member of the party should have some very long and light object, such as a long bamboo pole, a fishing rod, or an extended ball retriever. If you add the height of the upstretched arms of the partner to the length of the pole you would have a total height of from fifteen to twenty feet. Tie pieces of white or yellow ribbon at 5-foot intervals starting from the top down. Now the person doing the

Continues on page 32



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