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Katsura-tree (in older age), and Kentucky coffeetree, to name a few. The type that would be absolutely inappropriate for this location would be the beech. Its beauty comes from its lower branches bending right to the ground. You can see that in a few years these branches would block the area through which the ball must travel.

Next in order of preference would be the upright rectangular trees characterized by the sugar maple, the sweetgum, the ash, and the littleleaf linden.

When trees are planted at a relatively small size (fifteen feet high or less) they may look out of scale and too alone. However, we dare not make the mistake of going for a quick effect by placing in closer to the tee in order to frame the view in a short period of time. This would be disastrous both from a time standpoint as well as a financial investment. You cannot afford to fool yourself when you locate trees on a golf course. You must know in advance the characteristics of a tree and its potential size in order to be positively sure that it will not interfere with a properly struck golf shot.

The next thing to take into account is the average life span of the tree that you select. A few trees have an extremely short life span such as the birches, aspens, and Lombardy poplars. Some trees, on the other hand, have extremely long life spans. These are represented by many of our hard woods as well as some of our coniferous trees (cone bearing) such as pine, hemlocks, and spruces. Some of the longer lived trees are represented by the oaks, maples, sassafras, ash, sycamores, etc., etc.

Another consideration is the fact that certain trees completely change their structural form as they grow through middle age into old age. A classic example is the Pin oak (*Quercus palustris*). You might also include the Katsura-tree (*Cercidiphyllum japonicum*). These two trees start out as cone-shaped trees for their first 20 to 35 years. Their lower branches, if you were not to prune them off, would bend right to the ground. They would almost be shaped much like the classic "Christmas Tree". However, after 30-35 years, they begin to change their growth habits. By the time they are 50 years or older, they develop a clean bowl (trunk with no branches) and a wide, spreading crown. So you can see they would ul-

Illustration 1

- ①- "UP-FRONT" TREES.
- ②- MID-FAIRWAY GROUPS.
- ③- TREES TO FRAME THE GREEN.

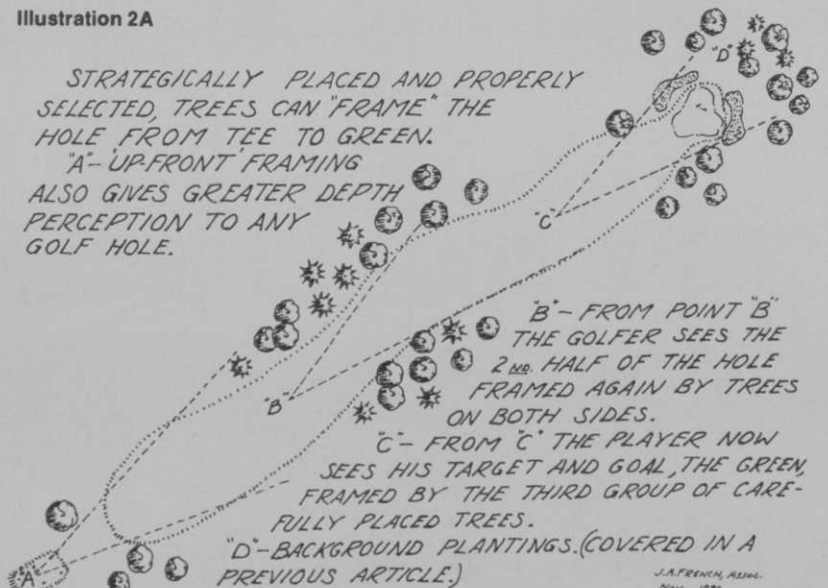


J.A. FREEMAN, Assoc.
Nov. 1980

Illustration 2A

STRATEGICALLY PLACED AND PROPERLY SELECTED TREES CAN "FRAME" THE HOLE FROM TEE TO GREEN.

"A"- UP-FRONT FRAMING ALSO GIVES GREATER DEPTH PERCEPTION TO ANY GOLF HOLE.



J.A. FREEMAN, Assoc.
Nov. 1980

timately form the ideal shape we described a few lines back. We bring this to your attention because it is very critical for you to understand everything about any tree that you place on your golf course.

Not only would trees used up near the tees give the aesthetic framing effect to the hole but they would also add the third-dimensional perspective that would be lacking if there were no trees around. Have you ever noticed post cards or travel posters trying to attract your attention to spectacular scenery? Invariably, there will be something close to the camera, such as an archway or overhanging tree branches that give a feeling of tremendous distance as you look at the focal point of the picture, such as a sailboat out in the

water. This is the other reason for using trees "up-front". It adds that all-important perception of depth to the picture.

You may never have thought of using trees for these specific reasons. Once it is explained, it becomes apparent why we get so precise in our choice of trees. If the wrong tree is planted at the wrong place, that mistake is rarely corrected. People for the next 150 years afterwards will suffer through these mistakes that we make now if we are not careful. Many times when we are working on golf courses, we recommend the removal of wrongly selected trees, especially when they are young, so that these mistakes can be remedied quickly and economically.

It is possible to use some conifers

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as up-front framing trees if you are willing to exercise patience. The white pines (*Pinus strobus*), for example, common in many of our states, do not lose their beauty when you cut off some of the lower branches. Of course, this should wait until the tree is at least 12-15 feet in height. Each year you can remove an additional whorl, or tier, of branches from the bottom since the tree adds to its height each year. We are not saying that these lower branches must be cut off. If and when they begin to interfere with properly hit balls, then and only then, should they be removed. Therefore, in a period of only 15-20 years you could use a white pine as a framing tree off the tee with overhead branches well up out of the way of the flight of the golf ball. Of course, the advantages of a tree such as the white pine are twofold. One, it is a year-round tree as far as green foliage is concerned, and the other is the picturesque characteristics it takes on as it struggles through old age, high winds and ice and snow storms. This is one of the few trees that can improve its unusual beauty while it is literally torn apart by the elements.

On the west coast golf courses, of course, there are the famous Torrey pines. They are the classic example of weather-beaten plants that get more beautiful as they grow older and become more contorted. These picturesque trees are priceless on a golf course if they are located in the correct places.

Then, of course, there is the additional bonus from trees around the tee of giving shade on hot days, especially when there is a waiting time on a par three hole.

Mid-fairway area

The next places where we will consider using framing trees are those farther out along the fairway. A par four, or par five hole can become very monotonous if there are practically no trees acting as partition plantings along one or both sides of the fairway. It appears to look more like a pool table than it does a beautiful golf course.

The precise location of these trees are so varied that it would be impossible to give typical examples, so therefore we will simply call it mid-fairway placement. This area can cover anywhere from 100 yards out all the way up to 300-350 yards. In fact, many times, in place of fairway



Two sets of framing trees—the "up-front" and a group coming in close to the cut fairway, creating the Mid-fairway framing.

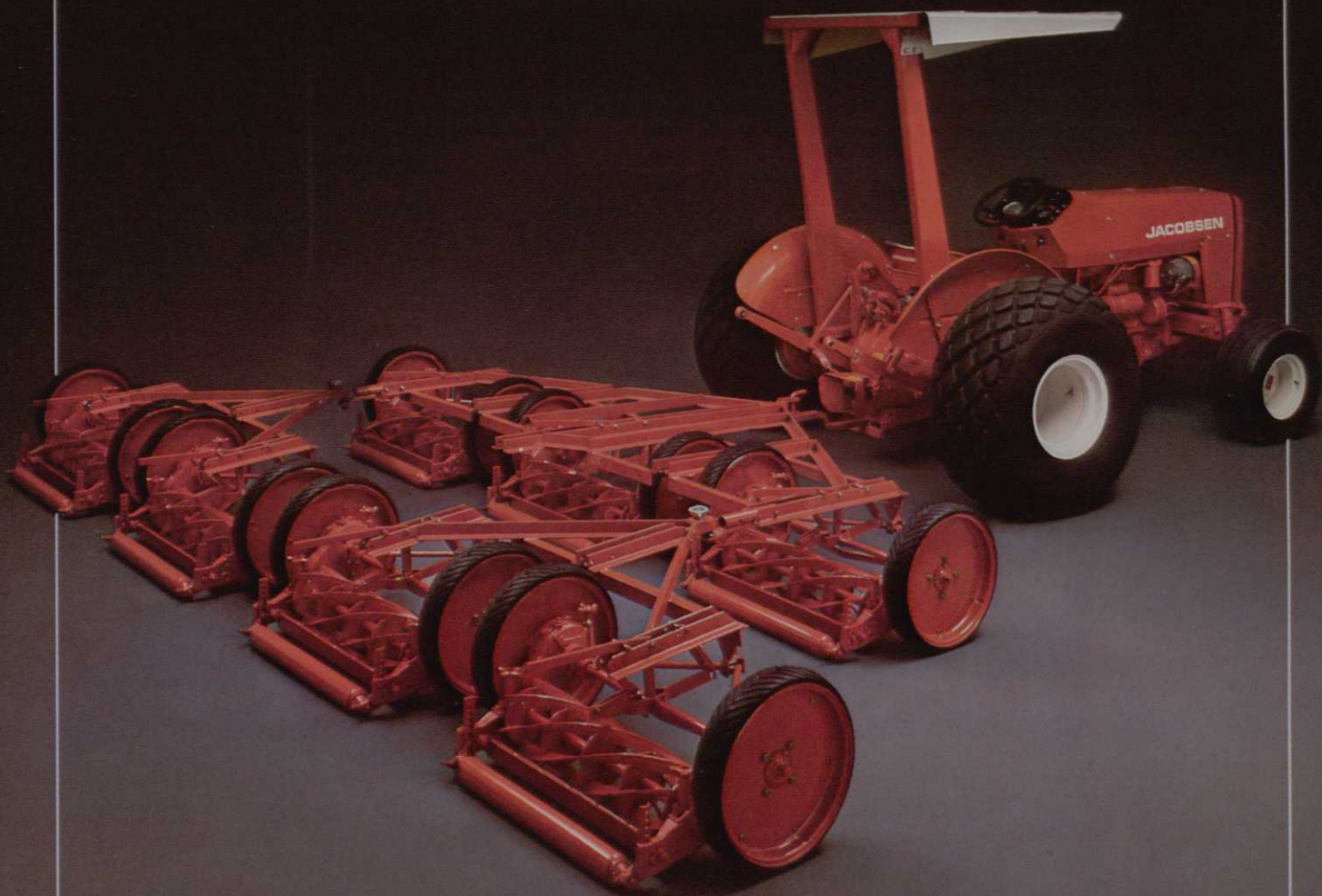


Mid-fairway framing trees as the golfer turns the dogleg to his left. Canoe Brook Country Club, Summit, New Jersey.



A striking setting for a green that is lower than the golfer's lie.

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Relatively young trees frame the par 5, 18th hole at Oak Hills Championship Course in Rochester, New York.



Up-front framing job being done with two young trees at Canoe Brook Country Club.



A classic example of "up-front" framing of a hole as well as the mid-fairway framing trees further down.

sand traps, trees are used to affect play. At the same time, however, they can be used strategically to frame the remainder of the hole which includes the picture of the green.

The same landscape principles hold true here as held true back at the tee. It is better to design an asymmetrically balanced, or unbalanced, framing of trees at the mid-way point. It would be inappropriate to plant one sugar maple exactly 200 yards off the tee in the left rough and then another sugar maple directly opposite it in the right rough at the same distance. This would be too stiff, too formal, and too unnatural. So therefore, even though we could (and often do) use the same species on both sides of the fairway, we try never to make the groupings identical. We try to keep the planting looking as natural as possible.

Sometimes a visual balance can be achieved with one tree in the left rough and three or more smaller trees over in the right rough. On a course that hardly has any trees at all, you can use groups that contain as many as fifteen or more trees.

Avoid straight "walls"

On courses that have been cut out of a dense woods or forest, many times the partition plantings look too much like perfectly straight walls. In these cases, the framing trees at the mid-fairway point not only act as framing trees but can also be used to break up that straight line effect left after the bull dozers went home. Correcting such deficiencies on a golf course can make the difference between an average landscape and an excellent one.

Check with the club pro

If the hole is playing too easy and the Green Committee wants to toughen it up, then we discuss it with the entire group. In this manner we know precisely where the general impact areas of the majority of the club members are and we also know that we will have the approval of all concerned. We then decide whether to toughen the hole or keep it as easy as possible, depending upon where we locate these groups of trees. For example, if you wanted to narrow the fairway, we could "hourglass it" by bringing extra trees in closer to the cut fairway in groups that would be generally opposite each other.

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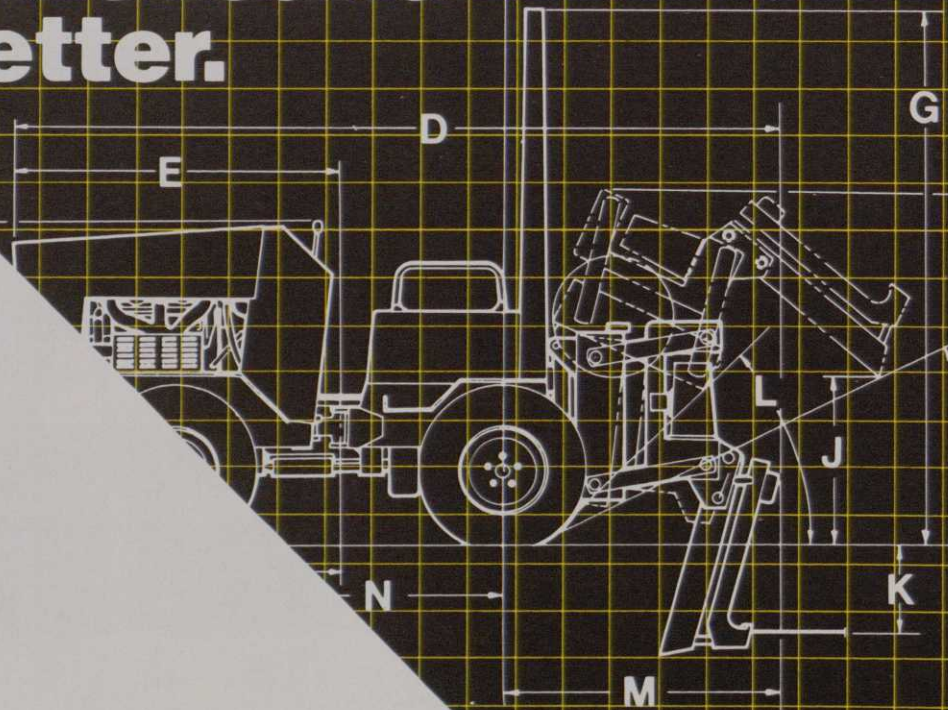
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lent traction with minimum turf damage.

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Now the golfer would have to thread his way through this constricted area.

If, on the other hand, the hole was already playing tough and we just wanted to add to the beauty of the hole, we would not put these groupings of trees opposite each other but, instead, we would stagger them. One group would be closer to the tee and the other would be farther down the fairway. This would allow the golfer to play through a wider safe zone than would be the case in the previous example.

Know your trees' growth habits

Again, we have to be careful of the type of branching structure we use here since the golf ball will be in the air on its way toward the next target. Once more, we must stay with the type that goes relatively straight up. In these situations, we must avoid the vase-shaped trees since they may some day hang out over the fairway too much. Now we should go primarily with accent trees such as cryptomerias, fastigiata pines and fastigiata hardwoods that are bred to go up in a column. These we rarely

use singly and are usually mixed in with other more or less upright growing trees. The upright rectangular silhouettes of the ash group, the sugar maples, the ginkgos, the tulip poplars, the littleleaf lindens, eucalyptus, the palms and the sweetgums would be suited for the best results. Hickory trees (*Carya*) also fit into this category as well as the relatively new one on the scene - the dawn redwood (*Metasequoia glyptostroboides*).

A most spectacular tree where it is native or where it will grow, is the sassafras (*Sassafras albidum*). It is a medium height tree reaching 35-40 feet at maturity. But it provides spectacular show of color in the fall. It can be used singly or in groups of from 5 to 30 or more to achieve a "grove" effect.

Use trees to control play

The golf course laid out on almost perfectly flat land can be made as easy or as difficult as the golf course architect and the landscape architect would want it to be, by strategically locating these trees. The landscape architect should know what the golf

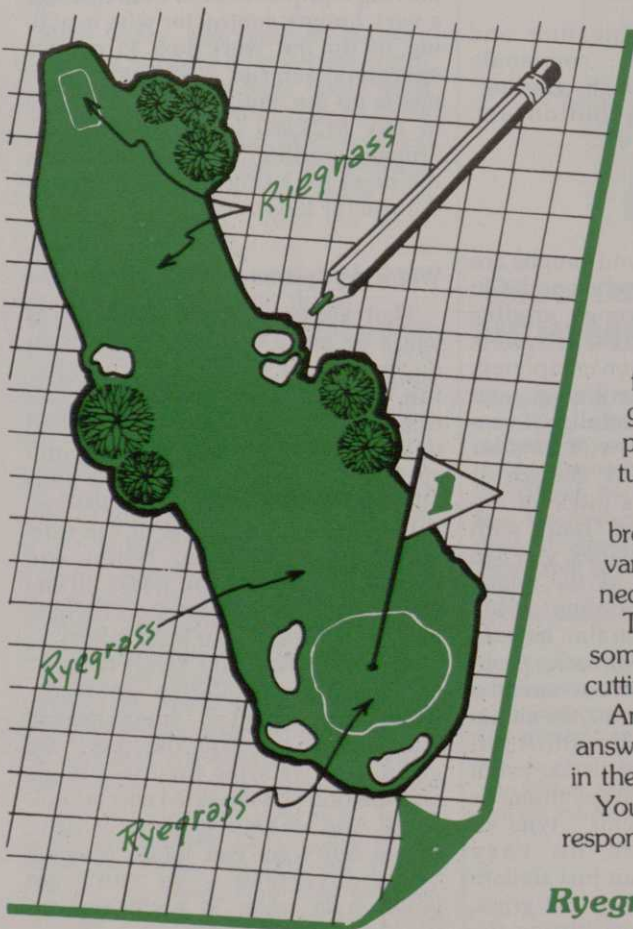
course architect had in mind for each hole, in order to landscape it so it can be played according to its handicap.

In those areas of the country where both deciduous and coniferous trees can be grown, it is often desirable to try to make these groupings a combination of the two types. It is much easier to attain a "composition" when the two types make up the grouping.

Very often on holes that border the out-of-bounds territory, the placement of these framing trees can have a beneficial effect for the golfer by tending to steer him away from the out-of-bounds.

In other unusual instances where a fairway slopes from left to right or right to left at an extreme angle, you certainly do not want to place trees that would make it impossible for the good golfer to spot his ball on the high side so that by the time it stops rolling it would not be down across the rough into the next fairway. All of these things must be taken into consideration when locating trees on your golf course.

Continues on page 42



Ryegrass Now Has an Added Dimension

Emergence of the highly successful, exceptionally handsome turf-type perennial ryegrasses lends further credence to the age-old claim that "ryegrass is the world's most widely used grass."

For years both regular annual and perennial ryegrass have found a ready home where there is need for a fast-germinating grass to quickly form a strong root system and provide a durable, handsome, inexpensive, easy-to-maintain turf.

The finer-bladed proprietary varieties have further broadened the realm of ryegrass. Now you'll find the turf-type varieties on every greenway where the finest possible turf is a necessity.

They have proven themselves on greens, tees and fairways of some of the world's finest golf courses, thriving at standard cutting heights as well as when close-cut for a putting surface.

And both the public and proprietary varieties are the perfect answer for the winter seeding of golf course greens and fairways in the Southern U.S.

You can count on ryegrass to germinate in a week or less, respond rapidly to fertilization and never require pampering.

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Oregon Ryegrass Commission - Salem, Oregon

Inflation has added its punch but do you want a Cadillac for a Chevy price?

What makes a golf course cost as much as it does?

By Joseph S. Finger & Associates, Golf Course Architects—Planners

"I know of a course that only cost \$60,000 to build just 30 years ago! Don't tell me it costs nearly a million dollars to build one now! Somebody is crazy!"

It doesn't, and we aren't! We hear this all the time. The trouble is, what the person is really saying is: "We were able to get a bicycle for only \$50 twenty-five years ago. Don't tell me a Cadillac costs \$15,000 now! Somebody is crazy!" After all, a bicycle and a Cadillac can both be called a "vehicle".

A \$60,000 golf course built 25 or 30 years ago was a "push-up" golf course. No style; no mounded, contoured trapped greens built to USGA specifications; no contoured, irrigated fairways with good drainage and the latest grasses; little "tee boxes" instead of large contoured tees, etc. It was really a "place to hit a golf ball", not a challenging, beautiful golf course. You can still build a "push-up" course for about \$250,000 (plus \$80,000 worth of maintenance equipment, left out in the open to rust); and that's about the same rate of price increase that a loaf of bread has enjoyed.

So what does make a golf course cost so much? Demanding golfers do! They've been around more. They've played better golf courses in other cities. They've seen beautiful courses on television. It makes them want one, too! They're not content to ride a bicycle or a Volkswagen; they want a Cadillac! But we can't understand why the costs should be that much more.

Let's examine briefly the elements of cost of a golf course and see who and what are responsible for such extravagant expenditures - the architect, the contractor, and/or the members. The big costs come from three categories of work:

1. Clearing and "excavation and fill" (cut and fill), commonly referred to as "rough grading" and done by big bulldozers, scrapers, draglines, etc.
2. The watering system
3. The greens

The fairways, tees, and roughs are really not that expensive to condition and plant after the rough grading and contouring and watering system (items 1 and 2) have been completed. Disking, dragging, fertilizing, and planting are still essentially "farming operations", done with smaller tractors. If you're good enough or lucky enough to pick a piece of undulating, well-drained land with trees in just the right places, you can eliminate about 80% of the rough grading costs and save about \$250,000. If you must build on flat, heavily treed, poorly drained, or rocky property, you're going to have to spend a small fortune to make it into an acceptable, challenging, beautiful golf course. If there are no trees, you'll have to plant 500 to 1,000 of them, or create a "Scottish moor" type of course (which can be very handsome!). Or, you can just smooth out the existing terrain, plant grass, hope it grows, and start hitting the ball, if that is what you want.

Rough Grading

A good set of tees will require 500 to 1,000 cubic yards of fill per hole, depending on several factors. That's 10,000 to 20,000 cubic yards per golf course. To make good greens with side, back, and front mounds on flat terrain requires from 1,500 to 3,000 c.y. per green, or 30,000 to 60,000 c.y. per course. If you are on rolling terrain, the requirements are usually 50% less.

Each fairway bunker calls for 200 to 1,000 cubic yards of fill. Creating rolls or undulations on relatively flat land can require from 5,000 c.y. (just to get the water off!) to 30,000 c.y. per hole! A good range of fill requirements for fairway modification on relatively flat land is from 50,000 c.y. to 150,000 c.y.; and it is not uncommon, where affordable, for these figures to double. On extremely hilly land, such large cuts and fills may be mandatory, unless players are willing to have blind holes, steep climbs, and virtually stand on their heads to address the ball, etc.

Add it up! 90,000 cubic yards, or more! Unless you own the earth moving equipment or are able to find a very hungry contractor who is willing to do the work just to get his operators salaries and make payments on the equipment, you'll have to pay \$125,000 up to \$400,000 for "rough grading". This emphasizes the need for being more selective of the site for the course.

Watering System

That \$60,000 course you built 25 years or more ago had 2-inch lines down some of the fairways to water the greens and tees only. Occasionally a 3-inch line was installed with quick coupling valves; and sprinkler heads on roll stands were attached to the valves, via 100-foot rubber hoses, and parts of the fairways were watered. When you played, you fought the hoses all the way around the golf course. Not bad, however, with 50¢ per hour labor.

No more. We want "wall to wall" watering, a completely automatic watering system so computerized that it will tell you the date, the amount of watering time still to go, and the odds on the third race at Belmont! And we want to water at night, so we don't get wet while playing. "Whatdayamean - ya can't get laborers to water at night even at five dollars per hour!"

Single row watering systems with