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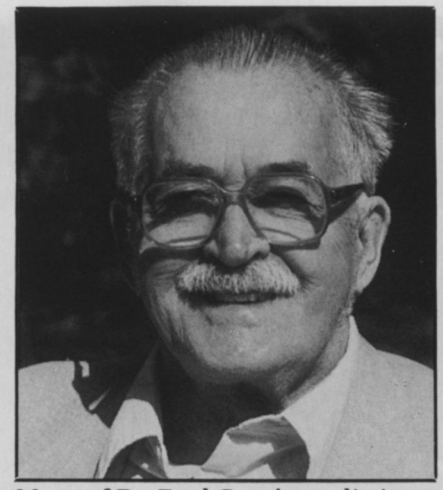
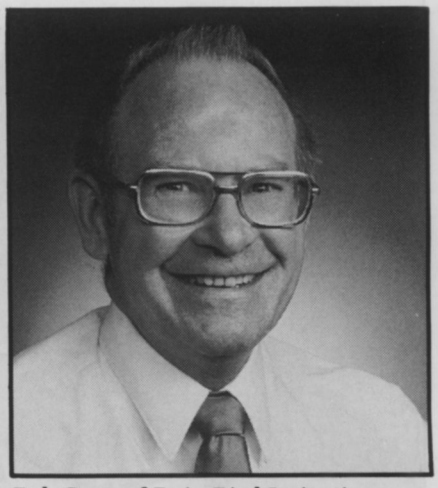


Many of Dr. Fred Grau's predictions of 20 years ago have come true in the turf industry.

Bill Bengeyfield of the USGA Green Section says TV has helped make golfers aware of good turf.



Bob Gray of Rain Bird Irrigation says computerization of systems allows for better water management.

breed for the "perfect" turf, irrigations systems are not only fully automated, but computerized, and the golf course superintendent is a full-fledged professional.

Teeing off

The game of golf originated in Scotland and came to America before 1900. According to records, a golfer named Dr. W.S. Haban requested assistance from the United States Department of Agriculture in 1906. There he met Dr. Charles V. Piper and Dr. Russell A. Oakley, scientists with a knowledge of turfgrass.

The two wanted to start experimenting, but funding wasn't available. In 1915, the executive committee of the USGA called on the Secretary of Agriculture for help in solving problems of greenkeeping.

They discovered that half the money spent on golf courses was wasted. In 1916, they began turf experiments in Arlington, Va. In 1917, the first turf book, "Turf for Golf Courses," was published.

In 1920, E.J. Marshall, Green Committee Chairman at Inverness Club in Toledo, Ohio decided to form the Green Section of the USGA in cooperatioon with the USDA. Piper served as chairman, Oakley as his associate.

From that time on, research continued at Arlington and then moved to Beltsville, Md.

One of the next historic dates in turf history is 1947, when Grau got turfgrass recognized by the American Society of Agronomy as a major agricultural industry.

In the '60s, the USGA developed the first putting green specifications. "That was a major contribution to golf," says the USGA's Bill Bengeyfield. "And they're still solid today."

About the same time, the increased use of the Stimpmeter, used to measure green speed, influenced cultural practices on the golf course. The Stimpmeter was actually invented in the '30s by Edward Stimpson, but wasn't commonly used until the late '60s.

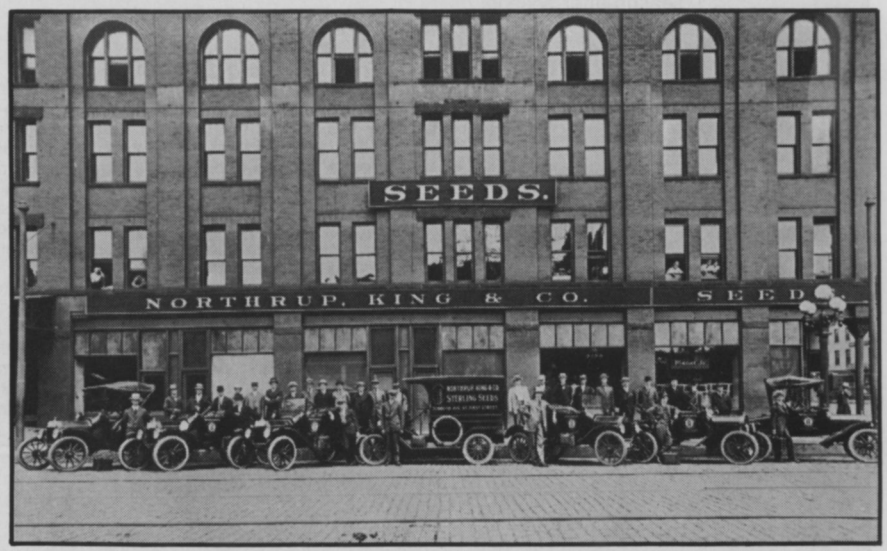
The introduction of television also influenced golf. "TV has helped make the amateur golfer aware of good turfgrass conditions on a golf course," Bengeyfield says. "Since the '60s, the quality, talent and education of the golf course superintendent has greatly improved."

More than Merion

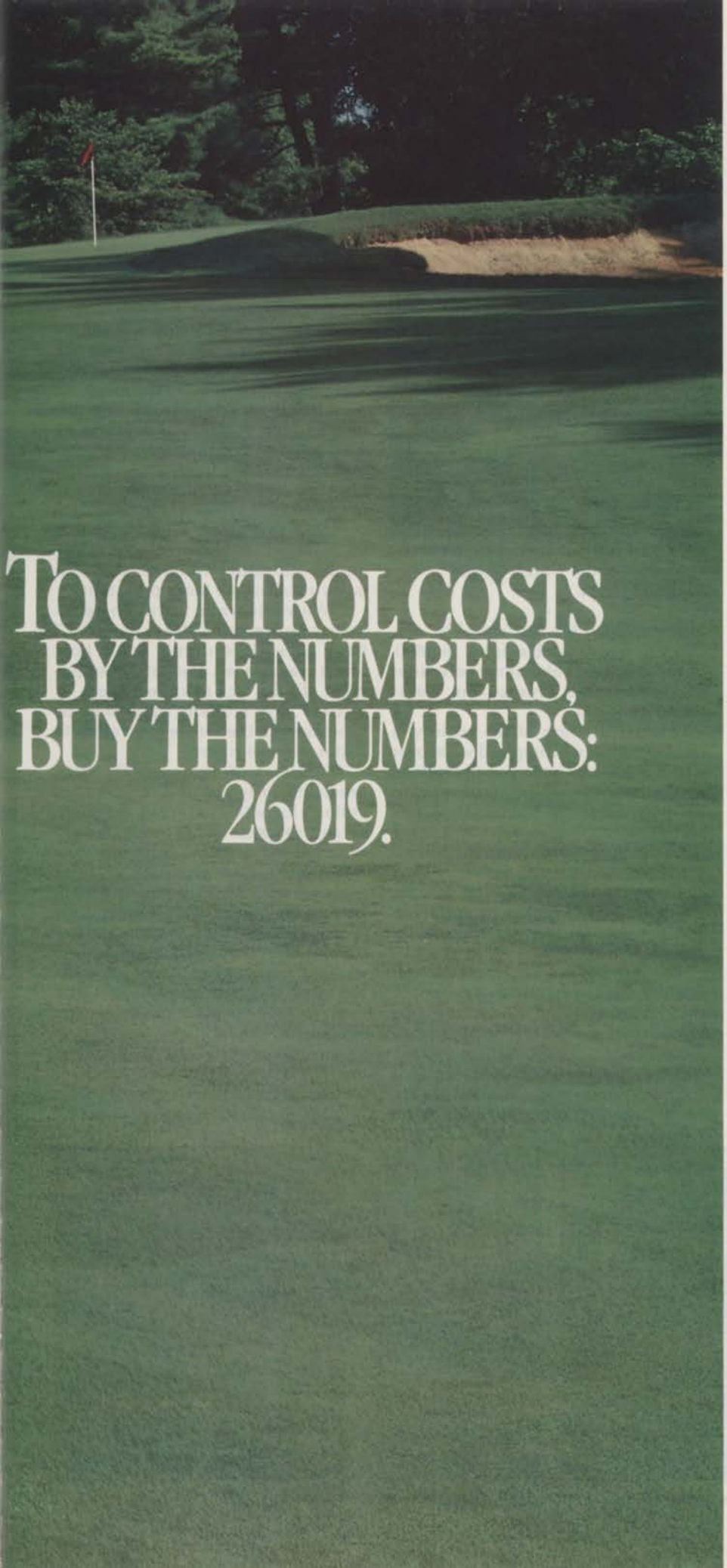
Superintendents needed to be more sophisticated to deal with the changes in the industry, especially improved varieties. In 1950, the Green Section, in cooperation with the the USDA, released Merion bluegrass, the first improved turfgrass variety. Meyer zoysia hit the market the following year.

"Merion was a superb development compared to common bluegrass," says Dr. Reed Funk of Rutgers University. "It was widely used by '62 and became the foundation for the sod industry." Funk was the first scientist to successfully hybridize Kentucky bluegrass. His research led to the release of varieties like Adelphi, Bonnieblue, Brunswick, Touchdown and Ram I.

Dr. Joe Duich of Penn State University cites the 1970 Plant Variety Protection Act as revolutionizing the seed industry. That act provided that the seed company could control production of its improved varieties released after 1970. Universities received financial support for research and larger seed companies started their own research departments.



Along with the development of improved turf varieties, seed production has become more economical. This 1915 photo shows the Northrup King sales staff.



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Funk says one of the biggest changes in the seed industry through the years has been the economics of producing quality seed. But as far as varieties go, Funk says the dramatic change in the past 25 years has been the improvement in ryegrass varieties.

"In '62 we didn't have any improved ryegrasses," Funk says. In '67, Manhattan ryegrass hit the market, followed shortly by Pennfine and Citation. Today, Funk and others are doing extensive research on endophytes (an insect-resistant fungus) in ryegrass.

The seed development of the decade has been the improved varieties of turf-type tall fescue. "Nurseries and breeding programs have an extreme interest in tall fescue," Funk says. "It's a fascinating story unfolding."

Some seed researchers are delving into more experimental areas such as tissue cultures. But despite the inroads made in the last quarter-century, Funk says he doesn't see one particular variety being the key to the future.

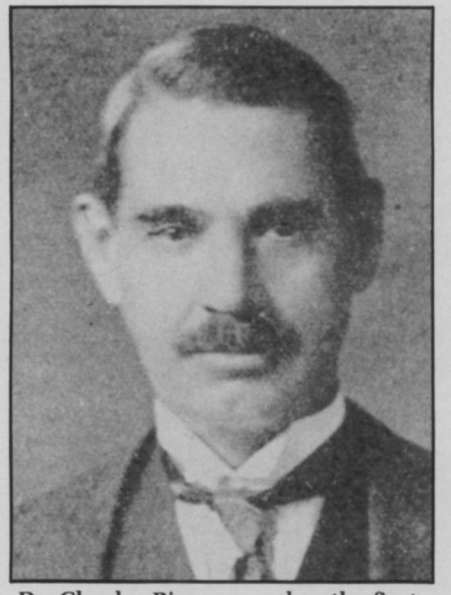
"There isn't any one species of turf for the future," he says. "Each year we get a better understanding of plant pathology, agronomy and soils. We should be able to keep up with the advances in science and utilize them."

Irrigation sophistication

Technological advances have led not only to improved turf varieties, but advanced irrigation systems as well. Water management is the subject of the future.

But to get to the future, one must also review the past. Irrigation can be traced to the ancient Greeks, Romans and Egyptians who built aqueducts for transporting water to areas of need.

According to Robert Gray, who has been with Rain Bird Manufacturing Co. for 37 years, a farmer named Skinner developed the first sprinkler system for his vegetable farm in 1890. Skinner drilled holes along both sides of a galvanized pipe so the water could spray out.



Dr. Charles Piper served as the first chairman of the USGA Green Section in 1921.

Around the turn of the century, a turning ratchet which spread water over a 50 ft. wide area improved the system. By the 1920s, the systems included spinner-type sprinklers, hose end sprayers and quick coupling valves.

In the early '30s Skinner introduced the first cam-driven rotor pop-up, Thompson marketed the first gear rotor, Rain Bird invented its sprinkler, and the first fairway system was installed.

Dr. Jim Watson of Toro says golf courses needed irrigation systems as they moved inland away from the humid seashores where the game originated.

The first fully automatic golf course system was installed in the early '50s. "Automation had taken over by the mid-'60s," Gray says.

Toro Irrigation bought out Moist-O-Matic in 1962 and entered the market previously dominated by Thompson, Buckner and Rain Bird.

Although late on the scene, Toro hit the market with its own innovations. In the '60s Toro replaced the brass and metal heads with plastic heads. Several years later, it developed the central and satellite concept in controllers.

"In February '86 we introduced the first truly totally automated system, the Network 8000," says David Morris, vice-president and general manager of Toro Irrigation. The Network 8000 calculates how much water should be used based on evapotranspiration readings and soil conditions.

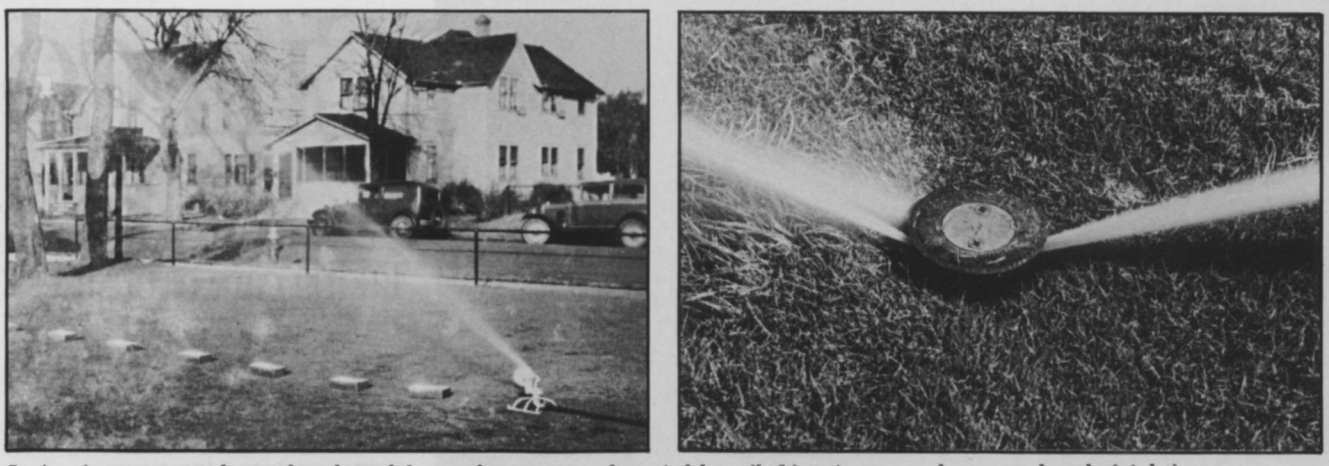
"One reason for the promotion of computerized systems is the accurate control," says Gray. When irrigation on golf courses became popular, poa annua and other water-related diseases also became more prevalent.

"We've learned through technology how much water is required," Gray says. "We didn't know how much was needed. It's not the equipment, it's the lack of knowledge."

Gray says effluent water will be used more in the future in an effort to better manage water.

More than 20 years ago Dr. Grau predicted fully automated irrigation systems for better water management. Of course, some of his predictions in that speech didn't come true, like mowing equipment which vibrates grass off with high frequency sound, sealing the blades against organisms.

But he ended his speech on a memorable note: "*I challenge each of you to let your imagination soar—jot down the ideal situation as you see it and then, in your imagination, design the equipment, the fertilizer, the grasses, to perform as you want. Who knows, one out of every thousand crackpot ideas may be the perfect answer for the future.*" **WT&T**



Irrigation systems have developed from above ground-sprinklers (left) to in-ground pop-up heads (right).

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TOUCHING ALL BASES

Incorporating an amusement park with a baseball complex provides plenty of maintenance curve balls under the Florida sun.

Boardwalk & Baseball will cover 135 acres of the Central Florida tourist mecca near Orlando.

by Jeff Sobul, assistant editor

I beat the drum and hold the phone,
the sun came out today.
We're born again;
there's new grass on the field.
Roundin' third and headin' for home,
it's a brown-eyed handsome man.
Anyone can understand the way I feel.
Put me in coach,
I'm ready to play, today.

—John Fogerty
"Centerfield"

Fogerty's lyrics demonstrate the popularity of baseball. And the dozens of amusements parks across the country are prolific money-makers. But combining them into one park?

At first glance, the concept seems an odd one: molding the traditional elements of an amusement park—rides, an arcade, shows, etc.—with six major league-size baseball diamonds, including a 5,500 to 7,000 seat stadium.

Considering it again, though, the concept is really rather innovative.

Boardwalk & Baseball brings these two American traditions together into one theme park.

Formerly Circus World, the park is located in the Orlando area, America's amusement park mecca. The park's theme, this molding of traditions, and the park's unique landscaping promise to bring visitors back.

Beating the heat

Part of the problem with Circus World, according to Boardwalk & Baseball horticulture manager Paul Shaw, was that the park offered no protection from the often intense heat of the Florida sun. Not only were there few trees, but the park floor was almost entirely asphalt, subjecting park visitors to a "skillet effect." By day's end, guests were literally fried.

Steps are being taken to alleviate this problem.

More than a mile of the asphalt paths will be covered with an authentic boardwalk of jarrahwood, a native of western Australia, layed down on aluminum frames. The sturdy reddish-brown wood (it has a lifespan of 50 years), which turns gray after a short time, is naturally resistant to the elements, fungus and pests, and needs no chemical treatment or varnish.

Topping off the park's heat resistance efforts are, of course, trees. Shaw (who has worked at the park five years) and his staff must maintain more than 2,500 trees. "Any oak tree, any palm tree, any type of tree on the premises, was planted here," Shaw says.

In preparation for the plantings, tons of asphalt from the old park were replaced with soil. Shaw's crews also had trouble moving larger trees through the park, and then had to contend with the summer heat when trying to maintain them. As a result, the

park will have two wells to help meet its high water needs.

Patrons of the park, however, should be appreciative. In all, the trees should provide about 70 percent more shade than previously existed.

Colorful carpet

Thousands of flowers will surround the trees and line the boardwalk.

The nursery crew, part of the horticulture staff, plans on three plantings a year, using about 200,000 annuals in 30 varieties. "I don't like to get monotonous. I don't like a lot of one thing. I like a large variety of textures, colors, sizes and shapes," Shaw says.

Many of the flowers are being kept in a greenhouse on-site and will be the last material planted. In addition to flower gardens, the park will have cactus gardens, blue vase juniper hedges and shrubs. "There will be color everywhere," Shaw comments. Warren's TerraCover, a polyester geotextile, will be layed between the sides of the boardwalk and flower beds to prevent sand from eroding into the boardwalk.

In a section of the park called the Oasis, foliage will be used as a noise insulator, isolating an area with a pond and fountains that can accommodate about 300 visitors at a time. Trees will line the area to keep park noise out, and classical music will be piped in. The area will be quiet, colorful and fragrant.

'Royal' treatment

When visitors have ridden the rides but still want more excitement, the baseball fields are located just past a bridge over the roller coaster.

Fogerty's line, "there's new grass on the field," is certainly accurate for the diamonds. Sod for the two fields that will be ready for the spring opening was being layed down in January and February. (A third field may also be ready for the opening.) The remaining fields, those in the cloverleaf, will be completed by the spring of 1988, just in time for the Kansas City Royals to begin spring training.

As a result, says director of baseball Floyd Perry, the fields must be in immaculate shape. With the Royals has come the assistance of George Toma, the team's field director and a 40-year green industry veteran.

Toma taught Mike Hurd, Boardwalk & Baseball's full-time field supervisor, as much as he could during Hurd's five-day visit to Kansas City last year. Toma has advised the architects and says the park will have an "excellent facility."

Horticulture manager Paul Shaw advises two of his nursery staffers in one of two greenhouses on site.

Toma stresses the importance of the practice fields ("More time is spent playing on those. Many people forget that.") and the infield dirt. "In baseball, a lot of people think the grass is the most important part of the infield," he comments. "It's not the grass. It's the dirt. You have four guys playing on it."

This emphasis is expressed in a meticulous field management program that pays particular attention to the condition of the infield. It will be dragged and smoothed a number of times before and after games and practices.

> *'I like a large variety of textures, colors, sizes and shapes'*
>
> —*Paul Shaw*

Toma's philosophy consists of three points: "First, give the best possible field for the players to perform on. Second, create a field of beauty for the fans and television. And, third, do it without taking money out of the owner's pocket." It is possible, he adds.

Hurd and his seven-man crew have worked long weeks to meet these criteria and prepare the fields, which will host a number of events in 1987. The outfield and infield will be Tifway 419 bermudagrass, with bahiagrass covering the out-of-play areas.

Perry notes, "the 40-foot deep sand base that we have will be topped with a Florida peat, mixed specifically for moisture retention" by the contractor, Central Florida Turf in Avon Park. "(They) say this is the best mixture for the soil we have."

To further meet major league baseball's high level of quality, warning tracks on the stadium and Royals' practice field (the 1,500 seater) will be made of an expensive New Jersey aggregate used in many major league parks.

Perry envisions the park becoming the hub of amateur baseball in the region. Already for 1987, Perry has commitments to host a game with the South Florida Major League All-Stars, as well as a spring senior showcase for area high school stars. The minor league Royals will be in town over July 4th weekend to introduce the area to the team.

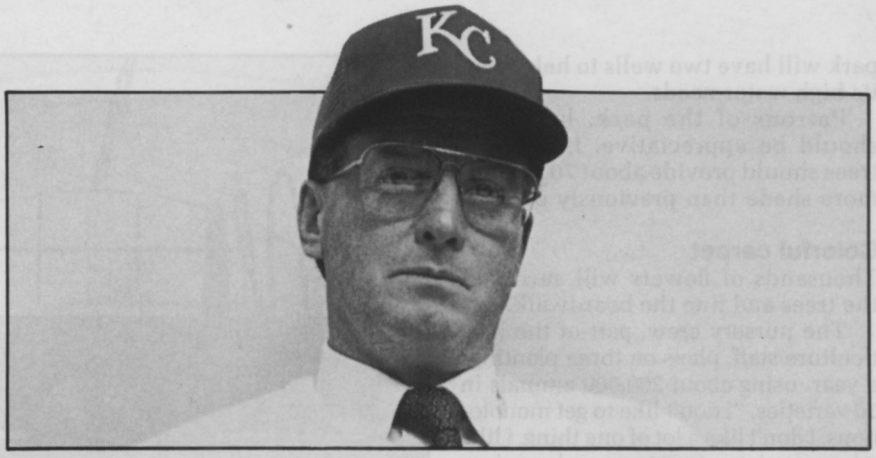
The Royals will play 16 games in the larger stadium (field two will also seat about 1,500 people in bleachers) during a 1½-month spring training period in March and April. When they leave, around April 15, a Class A team will begin an 80-home game schedule. "In 1988, starting March 1st, we already have 96 dates plugged in. We have to fill in between these slots.

"We've had proposals on the table for old timers games; we've had proposals on the table for fantasy camps; we've had proposals for youth tournaments of 16- and 17-year olds," he adds. "So we've had proposals. It's

now up to us to see which ones are best for our park. There's enough baseball here."

Baseball fans will be able to attend games without entering the park, and park visitors can attend games at no extra charge, except for the Royals' home games, which will have a small surcharge. In addition to the six fields, batting cages are being erected for both guests and the teams.

And when the sun comes out on Boardwalk & Baseball this spring, everyone will be ready to play. **WT&T**



As director of baseball, Floyd Perry has the task of scheduling events around the major and minor league Royals.

A NATURAL UMBRELLA

Boardwalk & Baseball will have enough trees to keep visitors cool

The project was a monumental one: transporting nearly 2,000 trees to Boardwalk & Baseball, storing them before planting, and then keeping them alive under the blazing Florida summer sun.

For horticulture manager Paul Shaw and his crew, it has been a series of challenges. Preparing for the plantings was a task in itself. "What they did when they built (Circus World)," Shaw jokes, "was fill the surface completely with lime rock and then they cut out where they wanted plantings.

"We've had such a lime rock problem, we actually mined it all out and put in good soil," Shaw explains. Along with that, the staff has had to contend with the aluminum frames layed down for the boardwalk, which have made it difficult to get the larger trees into the park. "We can't go on the boardwalk. It won't support the weight. So we have to try to find alternate routes."

The trees are transported through the park by means of a special padded forklift which keeps the bark from being stripped off.

continued on page 44

The padded forklift safely places one of the 2,000 trees into its new, seven-foot-wide home. ***(Photo courtesy of Boardwalk & Baseball.)***