



In this 1953 National Geographic photo, Fred Grau (left) pulls on a piece of sod, a combination of Meyer zoysia and Merion bluegrass, with Sam Mathews, who wrote the NG article. Grau's assistant Al Radko golfs in the background. The "combination" sod was called the answer to a golfer's dream.

A RARE BREED

If it weren't for turf research, golf course and landscape management wouldn't be as sophisticated as it is. Part three of WEEDS TREES & TURF's 25th anniversary series looks at developments in golf, seed and irrigation.

by Heide Aungst, associate editor

As far as speeches go, it had no impact on history. It didn't begin with King's eternal words "I had a dream..." Nor did it contain a particularly memorable phrase like Kennedy's "Ask not what you can do for your country..." Or revolve around an unforgettable character such as Nixon's dog Checkers.

But a speech that noted turfgrass authority Dr. Fred Grau made in 1965 did reflect on the industry in its infancy and forecast changes which have since come about.

It began: "The past is prologue. That is to say, everything we have done so far is only a beginning. There is no merit in reviewing the past unless, in so doing, we shape our course for the future. It is with this in mind that we dip back into significant chapters of turfgrass development and then leap ahead into the unknown, guided by the light of our burning mistakes..."

In that speech more than two decades ago, Grau predicted:

● "Labor will be half of the budget instead of $\frac{2}{3}$ to $\frac{3}{4}$ it is now." (The



As golf courses moved inland away from humid seashores, improved turf varieties and irrigation systems helped maintain the manicured look.

average rate is just approaching half).

● Putting green mowers, if we are still using grass, will cut four feet at a swipe and a man will guide it electronically. (WT&T just reported on the first artificial greens in use; greens mowers can cut that wide; and Kubota just come out with an electronically guided mower.)

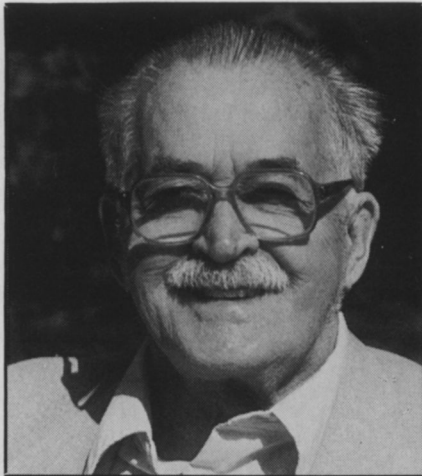
● Plant nutrients on fertilizer bags will be expressed in elemental form. (There's a recent movement among researchers to recommend this.)

● The grasses of the future will be disease-free versions of the best we have today. They will be bred for extreme resistance to drought, pests and wear.

● Sprinkler systems will be completely automated and designed to supply water as needed in minimal quantities.

● The superintendent or turfgrass manager will be a part of management on par with the pro and the club manager.

The last three predictions say it all. Although researchers continue to



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

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 cooperation 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 Bengueyfield. "And they're still solid today."



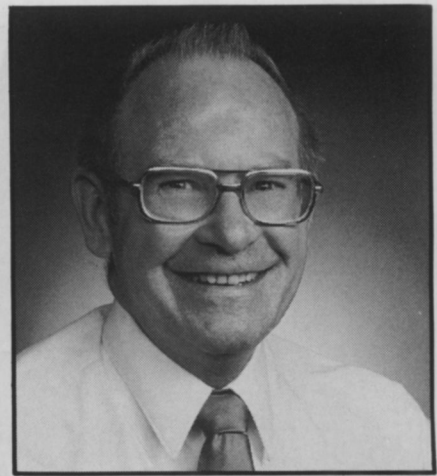
Bill Bengueyfield of the USGA Green Section says TV has helped make golfers aware of good turf.

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," Bengueyfield 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



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

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.

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.

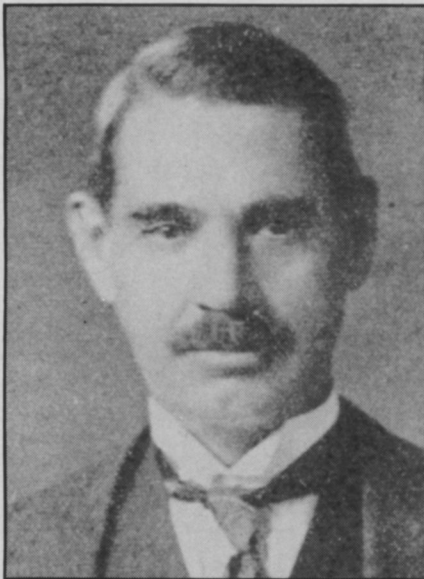
"There isn't any one species of turf for the future," he says. "Each year we get a better understanding of plant pathology, agronomy and soils. We should be able to keep up with the advances in science and utilize them."

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



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

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.

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.

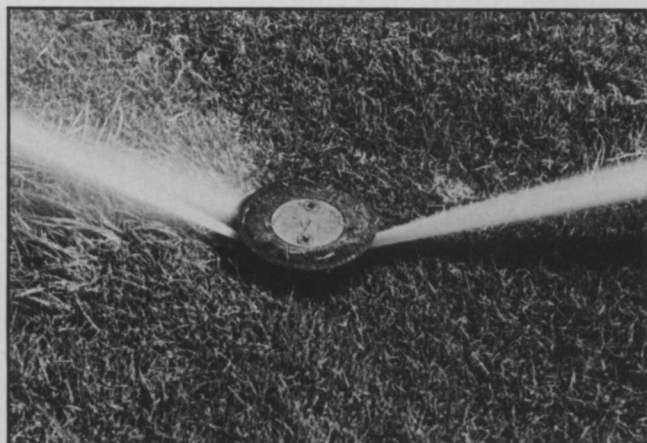
"We've learned through technology how much water is required," Gray says. "We didn't know how much was needed. It's not the equipment, it's the lack of knowledge."

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).