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creased rate of growth and deeper green color.

Consequently, recommendations were made for using high rates of fertilizer on golf courses. While it is necessary to use moderate amounts of fertilizer for good turf growth, the over-use of such elements as nitrogen produced a soft lush growth. On some fairways, accumulation of clipplings became a nuisance, particularly in wet weather, thatch accumulated on putting greens, turf became susceptible to bruising and to disease attacks, and in some cases the grass produced wider leaf blades, longer internodes and a resultant coarse texture.

When the needs of the player were made known to the research men (through superintendents and extension personnel who discussed problems at turfgrass conferences), the criteria for evaluating effects of fertilizer use were changed. Turf quality as related to the other management practices such as irrigation and mowing frequency which interact with fertilizer usage became the yardstick for determining the effect of fertilizer. These criteria replaced those of green color and rapid growth.

A similar example involves the matter of soil texture and structure. Every plant scientist learns early in his career that a loam soil high in organic matter is highly desirable from the standpoint of productivity and workability. Because putting greens represent perhaps the most intensive degree of plant culture known, scientists naturally recommended the best quality of soil for this important area.

Golf course architects selected the best loam soils available and amended these by the addition of manures and other organic materials. When standards were not quite so high and traffic was not quite so heavy, when a little brown-patch, a little clover and Poa annua were accepted as normal, such soils were satisfactory. As golfer traffic increased, as players became less tolerant of the blemishes brought about by weeds, diseases and "scald," it became necessary to educate the scientist to the fact the traditional loam soil was no longer a satisfactory medium for putting greens.

Noting the deficiencies associated with loam soils because there was no satisfactory way to employ tillage on a golf course that has to be kept in play, I initiated a series of experiments at Texas A & M University, supported in part by the United States Golf Association Green Section, which were intended to discover the attributes of a soil which would resist compaction, permit water penetration and percolation, permit air diffusion and support a satisfactory turfgrass cover.

When the results of the experimentation were gathered, they indicated the need for a very high percentage of sand in the mixture. At that time, recommendations based on this research were considered heretical by many scientists, but the resultant putting greens pleased the superintendents who managed them and the golfers who played on them.

Now, more than two decades following the beginning of this investigation, almost every putting green being constructed makes use of a soil mixture having a high sand content. Again the needs of the game had to be communicated to the scientists before they could provide the knowledge that would meet the requirements.

Therefore, communications and benefits flow both ways between the research agronomist and the golfer. The extension agronomist, the golf course architect and the golf course superintendent provide the conduit through which such communications must pass.

The interrelationships between agronomy, golf and the middlemen exist in many areas. Plant growth fundamentals must be recognized by the golf course architect and by the superintendent. The manipulation of the environment to accommodate both the principles of plant growth and the needs of the player is the job of the architect in the formulation of a design, and it is the job of the superintendent after the course is built.
The architect can make the superintendent's job nearly impossible if he misses the mark in his design concepts. On the other hand, if the architect has done a reasonable job, the superintendent's ability can make the architect's creation into a beautiful golf course or it can be a disaster.

The areas of drainage, irrigation, management of traffic, control of pests, the use of trees and shrubs, treatment of ponds and streams, selection of turf species, treatment of sand bunkers, and others represent challenges to the designer and to the manager in providing the condition required for the playing the game of golf.

Players with the highest degree of skill can demonstrate that skill only when the underlying elements of golf course excellence are employed to the highest level. The peak of near-perfection can be reached only when each person involved in the various disciplines has a thorough understanding of the needs and the abilities of his counterparts in the other disciplines.

**DESIGN continued from page 3**

the hole layout it provides; but if the slopes on the sides of these tees are enclosed with lumber as they are in some cases with steps leading to the tee, this will again mean increased labor costs and lack of efficient turf management because maintenance equipment will have to be carried by hand up to the tee to properly care for it.

Many times, the implementation of a swale here or there by the superintendent can save thousands of dollars in maintenance costs through the years if it causes the course to drain properly. How many courses have you seen where after a rain there has been puddling on greens, fairways or tees because of inadequate contouring?

The superintendent's presence during construction will enable him to gain valuable knowledge of the soils he must work with at various levels on his fairways, tees and greens. This can have a material effect on his maintenance program for future years.

All too often, superintendents are not aware of where drainage and irrigation pipes run on their courses because they don't have "as built"
programs to serve this growth area. A goal calls for as many as 100 consultants eventually, able to serve every state in the country with on-site clinics and workshops; and to establish state-wide seminars to teach teachers of beginning golf, available to any state on request. The Foundation also is stepping up its production of publications, instruction material and audiovisual materials which fit into the Educational Services plan.

Three extensive lists of information are found on the request forms for consultant services: A list of audio-visual materials for use in workshops, an example of the types of topics which could be selected for a teaching format and a sample workshop day. Following are these items:

**Films and Publications**

**16mm Motion Pictures** — Unit I "Welcome to Golf" (13 min.) — Unit II "Building Your Swing" (27 min.) — Unit III "Pitching, Pitch and Run, Sand Shots" (12 min.) — Unit IV "Putting" (10 min.) — Unit V "On the Course" (18 min.).

**8mm Loop Films** (Six super-8 cartridges for use in Technicolor or Kodak 120 Projector) — Grip-Address Routine — Full Swing — woods and irons — Short Approach — Pitch, Pitch and Run Shot — Putting — Sand Shot — Uneven Lies.

**Golf Instructor’s Guide** — Methods utilized by foremost teachers.

**Golf Lessons** — Illustrated essentials for learning basic skills, rules, etiquette.

**Easy Way to Learn Golf Rules** — Simplified illustrated explanations.

**Planning and Conducting Competitive Golf Events** — Comprehensive procedures for all levels of tournament play.

**How to Improve Your Golf** — Pictorial analysis of skill execution.

**Golf Teaching Kit** — Five foregoing publications compiled in a convenient notebook with hard vinyl cover.

**Golf Rules Wall Chart** — Reproduction of rules illustrations on a 23” x 25” wall chart.

**Visual Aids for Golf Instruction** — Packet of 40 posters illustrating basic skills, rules, etiquette.

**Planning and Conducting Junior Golf Programs** — A guide to answer, "How can we start a junior program at our school, at our club, or in our community?" — Development of area junior golf associations.

**ES Information Sheets** — Series covering specific topics in golf instruction, coaching and program organization.

**Topics for Selection**

- Methods of teaching the grip, stance and address routine
- Methods of teaching the full swing
- Methods of teaching putting and the short approach
- Analysis of errors and error correction
- Use of instructional aids in teaching
- Measurement and evaluation techniques
- Methods of coaching golf teams
- Advanced shotmaking — weather, recovery, topography shots
- Methods of teaching rules and etiquette
- Equipment purchase, storage, repair, club fitting
- Demonstration lessons using general students
- Lessons with specific clubs
- Formal question-answer session — staff panel
- Informal question-answer period — refreshments
- Meetings with special groups — faculty, student, administrative
- Personal consultation with sponsor or individual participants
- Others as desired

**Sample Workshop Day:**

8:30- 9:00 Registration — view NGF display
9:00- 9:15 Introductory Methods for Teaching the Modern Golf Swing
9:15-10:30 Fundamentals of Grip, Stance, Address Routine, Full Swing Progression
10:30-10:45 Break
10:45-11:45 Error Analysis and Correction Use of Instructional Aids — sight, sound, feel
11:45-12:00 Questions-Answers-Discussion
12:00- 1:15 Lunch (at workshop site)
1:15- 2:30 Short Game Progression Pitch, Pitch and Run, Putting
2:30- 3:00 Use of Audiovisual Aids NGF 16mm Films, 8mm Loops, hard core Video-tape, Sequence Camera
3:00- 3:45 Methods of Teaching Rules and Etiquette NGF Film: "On the Course"
3:45- 4:00 Summary Discussion — NGF Services and Materials
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Land Costs Versus Course Design

The skyrocketing cost of land has changed the face of golf, according to Robert Muir Graves, newly elected president of the American Society of Golf Course Architects.

Good land is hard to find. Just ask anyone that is trying to build a golf course today.

Shorter courses are the thing of the future, as real estate costs prohibit the availability of acreage. "There's no doubt about it, today's course is more compact than 10 or 15 years ago," said Graves.

Graves sees shorter courses adding something to the game, though. Finesse and accuracy could return, instead of brute strength which longer courses force players to strive for.

Surveys by the ASGCA indicate that the course of the 70s will be shorter, but not necessarily easier. Fairways will become shorter, but probably more narrower. Greens will also shrink in size, but more protection will come from traps and bunkers.

Some architects suggest that minimum green size could vary from 4,500 to 5,000 square feet. At that size, putting will retain its proper emphasis.

Possibly, on some par 4s and 5s, many players will be tempted to leave their drivers in the bag. More holes will be designed to reward the well-placed tee shot, instead of the long blast slightly off line.

Spray hitters of the future will be beset with fairway widths of 30 yards. Golf architects will now be putting tough things into smaller packages.

Besides its current report on short courses, the ASGCA also has a few opinions on slow play and how it affects courses and their membership.

Playing pace has the major part in determining the speed of play. Many have advocated golfers pass an etiquette test and shoot below a certain score before being allowed to play during heavy traffic periods.

Architects hope to speed play by the sequencing of holes by length and degree of difficulty. Most architects try to avoid penal holes, which cause the average golfer a great deal of trouble and cause slow play.

Officers to be Elected At PGA Annual Meeting

Early arrangements are being made for the Professional Golfers Association's 58th Annual Meeting, Dec. 3-6, at the Regent Hotel in Honolulu.

New officers will be elected at the meeting which will be presided over by President William Clarke, Secretary Henry Poe and Treasurer Donald Padgett.

Highlights of last year's meeting in Dallas were plans for a new home for the PGA, discussions of the image of the club professional and discussions of job status.

Ball, Club Manufacturers Set Fall, Spring Meetings

Rancho Bernardo Resort near San Diego, Calif., will be the site of the fall meetings of the National Association of Golf Club Manufacturers and the Golf Ball Manufacturers Association Oct. 13-16.

The two organizations will meet in conjunction with sports equip-
ment manufacturers, and will hold a joint meeting on the 15th, according to James R. Butz, president of Victor Golf Co., Morton Grove, Ill., and president of the club association.

Butz said there would probably be about 30 club manufacturers present representing 20 companies, and about 20 ball manufacturers present, representing 12 to 14 companies.

He said club manufacturers will work on a number of areas, including a study of Japanese imports, and a report from the technical committee which has been working with the United States Golf Association.

The technical committees for both organizations have been investigating new construction of both balls and clubs, and graphite shafts have been tested. The committees have also been investigating the possibilities of potential rules changes because of changes in clubs and balls.

The spring meeting for the club will be in late April or early May in Puerto Rico, and USGA representatives will be on hand to discuss technical matters.

**Club Managers Symposium Oct 14-16 in New York**

The Club Managers Association of America will meet Oct. 14-16 for its first symposium at Harrison House in Glen Cove, N.Y. The annual meeting will be Feb. 19-22 in Vancouver, British Columbia.

On tap for this first annual symposium will be a review of "the human relations approach to management, the psychological profile of the club manager and his club, and the power relationships between individuals and groups," according to Beverley F. Monroe, coordinator of the event.

Among faculty for the program are: Dr. Porter Crow of the U.S. Chamber Institutes for Organization Management, who serves as a consultant to chambers, schools and businesses all over the country; Don Fuller of Don Fuller Associates, who has served in a training or consulting capacity to many major firms such as U.S. Steel, DuPont, McGraw Edison and Eastman Kodak; and Robert C. Klekamp, who is associate professor of management at Xavier University and president of W. G. Seinsheimer & Associates, a management consultants firm.

Course content for the symposium consists of: human relations and human engineering, decision making, nature of the organization, role of the manager in directing a healthy and productive organization, psychological profile of the club manager, power relationships of individuals and groups, leadership, and ethics and morality.

The new Hyatt Regency in Vancouver is headquarters hotel for the annual meeting. Many of the conference committees will hold their annual meetings on Tuesday, Feb. 18, the day before the official opening, and conference activities will officially get underway with the opening business session Friday.

Seminars will be held Thursday and Friday mornings with roundtable discussions Thursday afternoon and a special feature presentation Friday afternoon. The closing business session will be Saturday morning followed by a formal dinner-dance Saturday evening.

For further information, contact the Association at 5530 Wisconsin Ave., Washington, D.C. 20015, or call 301-657-3670.

**Duling Elected President At Shade Tree Conference**

John Z. Duling of Duling Tree Expert Co., Muncie, Ind., was elected the new president of the International Shade Tree Conference in Atlanta last month. He
replaces outgoing president F. Lewis Dinsmore.

Hyland R. Johns of Asplundh Tree Expert Co., Willow Grove, Pa., was elected vice-president.

Almost 900 persons attended the conference held at the Marriott Motor Hotel in Atlanta. The program consisted of exhibits, educational sessions and equipment demonstrations.

Some topics discussed in educational sessions and panel discussions were a review of major tree diseases, trees in the landscape, new tree selection and business management.

The conference commemorated its 50th anniversary.

Superintendent Committee
The first meeting of the recently formed educational advisory committee of the Golf Course Superin-

tendents Association of America was held late last month at association headquarters in Lawrence, Kan.

Executive Director Conrad L. Scheetz said the committee is made up of leading educators from universities all over the country, and was formed to review the association's education program.

Scheetz said the committee will meet twice a year to review and update the education programs already being used by the association.

Irrigation Warranties to be Discussed
When does the warranty begin on a golf course irrigation system? Is it the date the system is sold by the manufacturer, or when it is finally installed and the water turned on?

Up to now, there has been a vague understanding among manufacturers, distributors, contractors and golf course owners. Many manufacturers say the warranty lasts one year and begins on the date of sale. Many owners say it sometimes takes longer than a year to get the system installed, and in this case the warranty is useless.

The Golf Course Builders Association, based in Washington, D.C., has formed a committee to study this situation and set up a meeting with major manufacturers to set a specific time limit on the warranty and decide when exactly it begins. The association will meet Oct. 22-23 in Denver, and this will be one of the topics on the agenda.

James Kirchdorfer, president of Kirchdorfer Irrigation Co., Louisville, Ky., will be involved in setting up this meeting.

"If the course is ready for the system, it can take maybe 90 days to get it installed," Kirchdorfer said, and he is both a contractor and a distributor, so he confronts any problems from two angles.

"If the course is under construction, then the installation might be done in stages, and this can take up to a few years of time," he said. "As things drag out in a situation like this, the contractor is evasive with what kind of warranty he can offer the owner, because the manufacturer is evasive with him."

Kirchdorfer said some contractors are gearing down there installations because of the problem with
the warranties, and the cost of the systems, which can run anywhere from $200,000 to $250,000.

"The industry is loose and unorganized, and until we get specific dates on the warranty, the owner is paying for any delays," he said. "What we have to do is procedure so that each sector in the process pays their fair share of the cost."

"Also, the idea behind this whole thing is not to have a better warranty, but to have a better product in the first place, so we don't have to worry about a warranty. The manufacturers simply should be able to make sprinklers, valves and controllers that work."

Manufacturers say they will be happy to meet with the golf course builders, but they really don't see that much of a problem in the first place.

They say that although the contract on the irrigation systems says the warranty lasts one year from date of purchase, most reputable manufacturers will extend that until a year after installation if a problem that occurs is definitely based on faulty material.

But the manufacturers also say that they should not be held responsible for faulty workmanship, like the system being installed too low and not working properly because of always being covered with mud and water. And the manufacturers also don't want to be asked to replace something that broke down from normal wear three or four years later, no matter when it was installed.

Acushnet Hikes Ball Price First Time in 18 Years

Acushnet Co., New Bedford, Mass., has increased the price of its top-line Titleist golf ball the first time since 1956.

The suggested retail price is now $1.35 each, an eight percent increase over the previous $1.25 cost.

"After 18 years we have been forced to increase this price," William Bommer, executive vice-president of Acushnet and general manager of the Golf Div., said. "Costs of raw materials, labor and supplies has escalated too severely and too fast to be totally overcome with new manufacturing techniques."

He said this price increase applies only to the Titleist brand name golf balls and not to other Acushnet golf products.

Hogan Changes From Forged To Investment Cast Head

When many major golf club manufacturers went to investment casting for their club heads, AMF/Ben Hogan Co., Fort Worth, Tex., chose to stay with the forged club head.

Early last month, Hogan came out with its "Producer" club line, and it features an investment cast head. Tim Scott, Hogan marketing vice president, explained why the company decided to follow the pack with its new line.

"Our major hang-up with investment casting was that the hardness of the work would eliminate the feel of our club and how long the ball stays on the club," Scott said. "We wanted to keep the sensitive feel of our club, and now we have developed a stainless steel alloy that is soft enough to duplicate the feel of our forged head club to the player."

Scott said Hogan has developed special heat treating processes that duplicate the soft feel of its forged head club. He said another advantage of the softer alloy is that the club can be adjusted to the individual player more readily than a traditional investment cast club.

NGF's Golf Shop Book Now in Third Edition

The third edition of "The Professional Golf Shop" is now available for purchase from the National Golf Foundation. Originally published in 1951 by Joe Graffis, the book establishes the actual role of the pro shop and its financial position in the golf course.

Completely revised, the new edition covers all phases of modern shop operation. In a forward by PGA Executive Director Mark Cox, he writes, "This is a publication that will prove invaluable to almost every professional on planning, merchandising, programming and generally administering all functions of his profession.

At a cost of $12 per copy, the publication is available from the NGF's offices at 707 Merchandise Mart, Chicago, Ill. 60654.
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Like others whose life had been largely occupied with golf course proprietorship, Hope was reluctant to turn his back on the game entirely.

Instead, he decided to shrink his golf course. Shrink it and upgrade its quality in every respect, while making a large portion of his land available for residential development.

"I wanted the right package for everyone involved," he said.

That included his existing neighbors who had built homes along the borders of the original course and his neighbors-to-be who would someday occupy the valuable land he would release for development.

"People don't realize how beneficial a golf course can be merely in cleansing the air," he said. "I wanted to maintain the environmental aspect of the area and I wanted to remain an area the city would be proud of."

Hope was cognizant of the fact Oakway was the only golf course open to the public in this thickly settled residential section of Eugene.

With that in mind, he retained John Zoller, golf course superintendent at Eugene Country Club and part-time golf course architect, to reduce Oakway to an 18-hole intermediate, or executive, golf course.

Zoller’s background included supervision of the recent remodeling of his own club by the highly regarded Robert Trent Jones organization, and the design of several nine-hole courses in Oregon. He had long been recognized as one of the Northwest’s most authoritative turf-grass managers as well as one of its leading amateur golfers. Zoller recently accepted the superintendent’s post at Monterey Peninsula Club in California.

The remodeling was to become, in fact, a complete replacement of the existing golf facility. Design and construction necessitated 18 new tees and 19 new greens, including the practice putting surface. It also included moving 83 sizeable trees and the addition of 42 sand bunkers where none had existed before.

Zoller was faced with a number of restrictions. Foremost was that imposed by the project manager of the real estate development which

continued to page 52