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(check one only)</p> <p>1 <input type="checkbox"/> Private</p> <p>2 <input type="checkbox"/> Semi-private</p> <p>3 <input type="checkbox"/> Daily fee</p> <p>4 <input type="checkbox"/> Municipal</p> <p>5 <input type="checkbox"/> Hotel/resort</p> <p>6 <input type="checkbox"/> Other golf facility (specify) _____</p> <p>7 <input type="checkbox"/> Driving/practice range</p> <p>8 <input type="checkbox"/> Manufacturer/rep.</p> <p>9 <input type="checkbox"/> Dealer/distributor</p> <p>10 <input type="checkbox"/> Golf association</p> <p>11 <input type="checkbox"/> Course builder/architect,
agronomist, other allied to golf</p> <p>12 <input type="checkbox"/> Other (specify) _____</p> | <p>2. Job function:
(check only one)</p> <p>1 <input type="checkbox"/> Owner <input type="checkbox"/> Partner</p> <p>2 <input type="checkbox"/> Golf course corp. president</p> <p>3 <input type="checkbox"/> General manager</p> <p>4 <input type="checkbox"/> Director/commissioner of parks & rec.</p> <p>5 <input type="checkbox"/> Superintendent</p> <p>6 <input type="checkbox"/> Assistant superintendent</p> <p>7 <input type="checkbox"/> Greenkeeper</p> <p>8 <input type="checkbox"/> Greens committee chairman</p> <p>9 <input type="checkbox"/> Elected club official (paid only)</p> <p>10 <input type="checkbox"/> Other (specify) _____</p> | <p>3. Size of golf facility
(Check one only.) <input type="checkbox"/> 9 holes <input type="checkbox"/> 18 holes
<input type="checkbox"/> 27 holes <input type="checkbox"/> 36 or more holes</p> <p>4. Does your facility operate a practice/driving range?
<input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>5. Total yardage of facility: _____</p> <p>6. Number of members: _____</p> |
|---|--|--|

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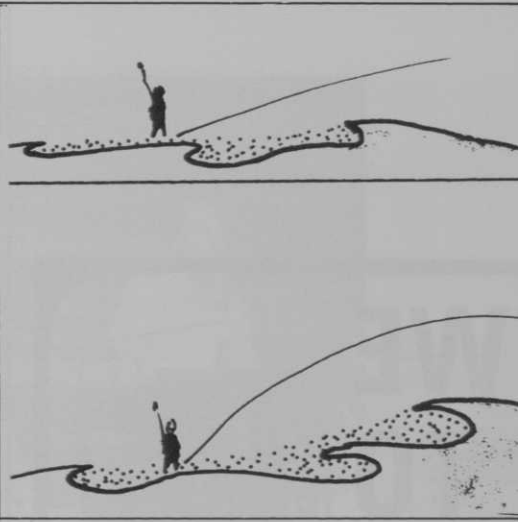
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Turfgrass basics/p. 10



Bunker placement/p. 14



Municipal maintenance/p. 18

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FRONT COVER:

This huge bunker sits on the right side of the number 6 fairway on the North Course at John's Island Club in Vero Beach, Fla.

Idea file 4

News 5

Clippings 9

FEATURES

The six basics of turfgrass establishment

Certain basic variables affect the establishment of any grass on any golf course. One of America's premier golf architects explains each one and its effect on the choice of seed or stolons planted 10

How good a manager are you?

Superintendents, owners, GMs, and other managers can grade themselves on their answers to these eight questions—and upgrade their management skills as well. 12

How bunker placement affects play and maintenance

The treatment of bunkers in golf course design may not seem profound—but it is important. How bunkers are placed on your course can have great effect on how much golfers enjoy playing it—and on how difficult it is to maintain.... 14

A park director is not a golf superintendent!

The way in which a municipal golf operation is organized can greatly help or hinder the superintendent charged with maintaining the golf facilities. One who should know (12 years as a municipal superintendent) tells what can happen and shows how some problems can be avoided..... 18

Products 22

Information service 24

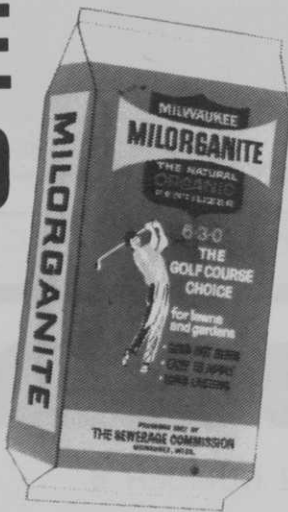
Classified 25

Viewpoint 26



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WHAT DO WE ADD TO



NOTHING!

Everything's Already There — Naturally

The Sewerage Commission, 8500 S. 5th Ave., Oak Creek, Wis. 53154

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Idea file

Remind golfers: repair ball marks

From the newsletter of the Maine Golf Course Superintendents Association comes this suggestion for a sign that might be profitably displayed around your golf course:

A fresh ball mark can be repaired by a player in just 5 seconds.

A freshly repaired ball mark will completely heal in just 24 hours.

A fresh ball mark left unrepaired for only one hour requires 15 days before the ugly scar has satisfactorily healed.

PLEASE REPAIR ALL BALL MARKS

Look out for built-in accident potential

Ever turn the right-hand faucet knob and scald your fingers because somebody reversed the water lines when installing the faucets? Ever flick a light switch up to turn on a light, only to have some other light go off? Ever turn a throttle to speed up an engine, but have it slow to idle because the control was designed "backwards"?

"Violate these and other human expectancies during design and installation, and human error and associated accidents become inevitable," says safety engineer Dr. Gary S. Nelson.

What can you do? First, be careful and thoughtful when installing control mechanisms yourself—whether it's a throttle on a mower or a faucet in the men's locker room. Second, when you find something improperly designed or installed, do something about it—fix it if you can, or write a letter to the manufacturer or installer if you can't change it yourself.

Letter to lender aids loan application

One key to securing a bank loan is a typewritten letter shortly after your meeting with the lender stating the points you discussed during the initial meeting, says Somers White, a management consultant in Phoenix, Ariz.

White says a study by the psychology department of a leading university says a banker has forgotten 64 percent of the information you told him the morning after the meeting and almost all of the information after one month. The letter, therefore, should contain a summary of your capital, earning capacity, cash flow, effect of the local economy on your operation, collateral, and character of your management (work for United Fund, etc.).

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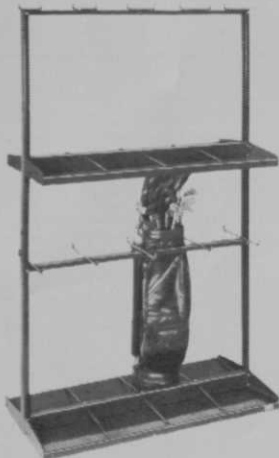
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News

FIELD DAYS

Demonstrations highlight ASPA meeting

The latest technology in turf seed and sod production was demonstrated to several hundred people during the 12th annual convention and field days of the American Sod Producers Association in Spokane, Wash., last month.

A tour through the Jacklin Seed Co.'s new headquarters in Post Falls, Idaho, and a trip to its turfgrass producing fields showed the sod producers the complete cycle of turfgrass seed growing and processing. Other demonstrations at the Thayer and Schneidmiller sod farms showed off new equipment and techniques. The sod growers naturally were interested in seeing the new sod harvesting equipment in action, as well as the laying of two types plastic netting for sod growing.

The first type, from Western Cascade, Inc., utilizes DuPont Vexar netting; the second, Conwed netting and a Robark layer.

Advantages of the netting are said to be a shorter production period and better tensile strength for sod. The same type of netting can also be used on golf courses to control erosion and hold soil and seed on embankments.

A unique irrigation system was displayed at the meeting and shown in an installation in a field; called Agri-Pop, its spray heads are placed 18 or more inches beneath the surface. The heads work their way up for sprinkling, then retract into the ground when the water goes off. The advantage is that the surface soil can be worked without damaging the sprinkler system.

Gang mowers were displayed and demonstrated by Brouwer, Toro, Roseman, and Pen-Gro Corp. The latter is American distributor of British-made Ransomes equipment and showed an impressively smooth and powerful gang mower based on a Massey-Ferguson tractor powered by a three-cylinder diesel engine. Brouwer demonstrated a new PTO mower available in five and seven-gang versions.



ABOVE LEFT: Doyle Jacklin, Jacklin Seed Co., chaired the ASPA convention and hosted a tour of his firm's new facility; 1977-78 president Glenn Rehbein sits next to him. ABOVE: British-built Ransomes gang mower, modified with wide turf tires, was impressively demonstrated by Pen-Gro Corp. LEFT: Brouwer Turf Equipment Ltd. showed its new gang mower.

All of the major seed companies had displays at the exhibit hall in the convention hotel. Next year's ASPA field days are set for Columbus, Ohio. The winter meeting will be held in Scottsdale, Ariz., in February 1979.

GOLF EQUIPMENT

Bad news from sales survey

A statistical report prepared annually for the National Sporting Goods Association, a trade association for sporting goods retailers, paints a gloomy picture of sales of golf equipment.

Out of two dozen categories of sporting goods included in the survey, golf equipment was one of just four which showed a decline in actual sales from 1976 to 1977 — and golf equipment was the only category which shows a decrease in projected sales for 1978

compared to 1977. The 1976-77 figures registered a 5 percent decrease in sale of golf equipment, with a similar decrease predicted for 1977-78.

Titled *The Sporting Goods Market in 1978*, the report is based on a survey of 32,000 American families. For further information, contact the NSGA at 717 N. Michigan Ave., Chicago, IL 60611.

TURF RESEARCH

Sod growers support Fusarium research

The Sod Growers Association of Mid-America has pledged \$5,000 per year for 3 years to Cornell University to support research on Fusarium blight. The association selected Cornell's Dr. Richard Smiley to conduct the research; his reports will be available to all participants. Contact: Dorothy Warren, 11020 S. Roberts Rd., Palos Hills, IL 60465.

LABOR

Save money by hiring welfare recipients

"Employers are literally losing money by not hiring persons on welfare or in the Work Incentive (WIN) program," Assistant Secretary of Labor Ernest G. Green pointed out recently.

"Too many employers do not seem to be aware," he explained, "that they can deduct 20 percent of the wages paid such persons on their payroll, subtracted directly from the total income tax they were prepared to pay."

Green's statement came with the launching of a nationwide campaign to inform employers of current eligibility rules. Originally, employers could qualify for the employment tax credit only if the new employee was registered with WIN, but that has been expanded to include employment of anyone who has been receiving Aid to

NATIONAL GOLF FOUNDATION BOX SCORE

January-June 1978		REGULATION COURSES	EXECUTIVE COURSES	PAR 3 COURSES	TOTAL
OPENED FOR PLAY	New	23	6	2	54
	Additions	19	4	0	
STARTED CONSTRUCTION	New	29	3	1	55
	Additions	19	2	1	
PROSPECTIVE		53	5	4	62

Families with Dependent Children (AFDC) continuously for at least 90 days prior to being hired.

Jobs must meet certain standards as well. They must be vacancies or new positions, not jobs created by a strike or layoff. They must also offer the same wages and benefits as similar jobs in the company and comply with all labor regulations, including federal minimum wage laws.

A government pamphlet is available which explains the tax credits. It is titled *Employment Tax Credits Can Reduce Your Income Taxes and Here's How* and is

available at local WIN programs, located in Job Service office of state employment service agencies.

OSHA

Followup inspection scheduling loosened

The Occupational Safety and Health Administration has announced the liberalization, "because of work overloads," of scheduling requirements for

followup inspections to citations for serious violations.

The amendment to previous guidelines, sent as a directive to all OSHA field and national offices, now will allow area directors to determine that followup inspections are not required except in cases of "imminent danger, willful and repeated violations, and petitions for modification of abatement." Such inspections had been mandatory for all cited, serious violations.

The directive was effective June 22.

ethoprop. The product should not be used on bentgrasses, fine fescues, or ryegrasses.

For further information on this product or about *Ataenius spretulus*, contact a ProTurf technical representative or call Scotts collect at 513/644-0011.

Lower rates approved for insecticide

Proxol 80 SP, an insecticide product of the TUCO division of The Upjohn Co., has received label approval for reduced rates in the control of cut worms, sod web worms, and army worms.

The new low application rate is 1 1/2 ounces of Proxol per 1,000 square feet of turf. For greens, Proxol should be mixed in 5 to 10 gallons of water for uniform application. On fairways and other large areas, the product should be applied using sufficient water (not less than 10 gallons per acre) for complete coverage.

In addition to improved economy in spraying fairways and other large turf areas, the lower rate of application permits the programming of Proxol 80 SP with turf fungicides on an alternate weekly basis. Proxol is said to "control damage-causing insects without appreciably reducing beneficial insect populations."

SUPPLIERS

Jacklin moves to new Idaho facility

One of the world's largest producers and marketers of Kentucky bluegrass seed, Jacklin Seed Co., has moved into new headquarters in Idaho just 20 miles east of where the company's offices had been since 1935.

The 6,000-square-foot office facility shares a 22-acre site with a complex of warehouse and seed processing buildings. The new site gives the company room to grow, said General Manager Duane Jacklin, and "the location is more centrally located relative to the company's farms and those of our growers in northern Idaho."

Part of the Jacklin operation remains in Spokane and will be moved to the new Idaho location in about 2 years.

Jacklin can now be contacted at Route 2, Box 402, Post Falls, ID 83854 (phone 208/773-7581).

TURFGRASS SEED

Fescue receives variety certificate

The Agricultural Marketing Service, U.S. Department of Agriculture, has awarded U.S. Plant Variety Protection Certificate No. 7500043 to Banner Chewings Fescue.

Developed at Rutgers University, Banner has been tested and evaluated throughout the country and has shown characteristics to recommend it for turf areas where abuse and minimum maintenance make turf management difficult. The fescue develops a dense, moderately low-growing turf. Sod is of high tensile strength. Banner is currently in production by E.F. Burlingham & Sons of Oregon, who hold exclusive rights for the variety. Adequate supplies are expected for 1978 seeding.

TURF CARE

Nematicide registered for *Ataenius* control

ProTurf Nematicide/Insecticide, a product of O.M. Scott & Sons, is now nationally registered for control of *Ataenius spretulus* larvae, a destructive beetle grub showing up on golf courses in many parts of the country.

This is a granular product for dry application. When watered into turf after spreading, it goes directly to the zone most vulnerable to *Ataenius* attack: the roots. ProTurf Nematicide/Insecticide controls a wide variety of nematodes and insects, and it can be applied anytime grasses are actively growing and insect damage is noted. Its active ingredient is

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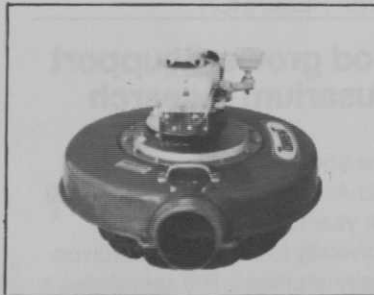
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The Torrential is efficient, easy to operate and economical. It could be exactly what you need for the coming season.

Here's what Wally Mund, former National PGA Secretary and for 40 years head pro at Midland Hills, says, "The Torrential is a real boon to course superintendents with a water problem. It's a necessary piece of equipment for any golf course. At Midland Hills, we have two of them."



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The new "Little-Big" tractors from John Deere. Now there are two rugged and reliable tractors built to handle jobs too big for a lawn and garden tractor and too small for a farm or industrial tractor. The 22 PTO hp 850 and 27 PTO hp 950 are built to do the jobs you need to do.

The 850 and 950 have big-tractor features for big-tractor versatility. Their 3-cylinder diesel engines are liquid-cooled and fuel-efficient. Transmissions have 8 well-spaced forward speeds, 2 reverse, for creeping below 1 mph to a top speed for transport close to 12 mph.

The "Little-Big" tractors turn within a 10-foot radius. Both have a fully-shielded 540-rpm rear PTO. A differential lock that engages on the go is standard along with a 3-point hitch (category I) and an adjustable drawbar. Tread width adjusts front and rear. Ground clearance is nearly 14 inches under the 850—more than 15 inches under the 950.

A lift-up hood makes an 850 or 950 easy to service. Adjustable, fully-cushioned seats make them comfortable. And behind these new tractors is your John Deere Dealer with an expert service staff, complete parts inventory, and a long-term commitment to keep them running like new.

If you have mowing, loading, plowing, digging, planting, or cultivating to do, an 850 or 950 Tractor will do it. See your John Deere Dealer soon for complete details or write for free literature to: John Deere, Box 63, Moline, Illinois 61265.

Choose from a family of tractor-matched implements for all the jobs you need to do:

Center-Mounted Rotary Mower	45 Integral Plow
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31 Integral Disk	100 Integral Disk
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GOLF CAR COMPARISON CHART

Comparison based on data published by Golf Business and P.G.A. magazines; actual tests; and random survey of dealers and courses.

GOLF CAR (4 WHEEL)	WEIGHT including batteries or gas (pounds)	APPROXIMATE RETAIL PRICE 8/1/78	NUMBER OF HOLES PER 12 HOUR CHARGE ON MODERATELY HILLY COURSE (Approximate)	HILL CLIMBING (Approximate degrees)	* BODY AND FRAME DURABILITY	RANGE OF OPTIONS (Number)	BATTERY LIFE (Months)		** ESTIMATED RESALE VALUE AFTER 4 YEARS (% of original purchase price)
							North	South	
DAVIS 500	850	\$2077	67 - 70	30 - 35	Excellent	15	24/36	18/20	30 - 45
EZ-GO (x-444)	1035	2348	36 - 40	20 - 25	Fair	15	18/22	11/13	20 - 25
CLUB CAR	868	2370	67 - 70	30 - 35	Fair	10	24/36	18/20	25 - 35
HARLEY DAVIDSON ELECTRIC (DE-40)	900	1925	36 - 45	25 - 30	Fair	5	18/22	11/13	20 - 30
HARLEY DAVIDSON GAS (D-4)	821	2270	—	30 - 35	Fair	5	—	—	15 - 25
PARGO	1050	2395	54 - 60	20 - 25	Fair	5	20/24	12/13	15 - 25
TAYLOR DUNN (T-Bird)	1125	2200	36 - 40	20 - 25	Fair	12	20/24	11/13	20 - 30
MELEX (212)	1075	2245	36 - 40	20 - 25	Fair - Poor	3	20/24	11/13	15 - 20
BOGUE (BE-405)	940	1795	40 - 45	23 - 28	Fair	5	20/24	11/13	20 - 25
GO-FORE	1075	2050	36 - 40	20 - 25	Fair	8	20/24	11/13	20 - 30
NORDCO (Marketeer)	1100 (approx)	2395	36 - 40	20 - 25	Fair - Good	9	18/22	10/12	20 - 30
YAMAHA (Gas)	825 (approx)	2995	—	30 - 35	Fair	3	—	—	25 - 35

*The DAVIS 500 is the only golf car made with a rigid, heavy duty, rubber clad steel external frame for 360° collision protection against body damage and misalignment of steering and drive train components.

**Percentages reflect body condition; battery replacement; frame alignment; tire, motor and drive train wear; and a factor of rapidly growing importance — the car's efficiency in terms of electric utility costs required to operate.



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Clippings

Short pieces of news from in and around the golf business . . .

Golf course maintenance made national news in *Time* magazine last month when Senator William Proxmire discovered that the U.S. Air Force had allocated **\$18,799 for filling the sand traps** on the golf course at Lackland Air Force Base in Texas. The Pentagon reportedly replied: "We report shamefacedly that the military indeed provides some recreational facilities for its people."

Time quoted Proxmire as saying he had no objection to the military maintaining golf courses "as long as it is accomplished with nonappropriated funds, and that means not with taxpayers' money."

Local turf and superintendents' associations are offered the free loan of a 30-minute slide program that depicts the development and use of **sulfur coated fertilizers**. This noncommercial program covers the entire history of the development of these economical controlled-release fertilizers at TVA, from the earliest research to the present stage of full-scale production at TVA's National Fertilizer Development Center. Persons interested in borrowing the program should contact John Horvath, Lakeshore Equipment & Supply Co., 300 S. Abbe Rd., Elyria, OH 44035 (phone 216/323-7544)

Arnold Palmer recently christened the 19th Hole at **Palm Coast (Fla.) Golf Club** by swinging a three wood against the building instead of a champagne bottle. He also shot



two under par on the back nine after he and golf course architect Ed Seay signed a contract with ITT Community Development Corp. officials to design Palm Coast's second golf course. The new course is scheduled to open for play December 31, 1980.

Colorado State University will host the **Rocky Mountain Regional Turfgrass Field Day** on September 8, 1978.

The Michigan Turfgrass Northern Field Day will be September 13 at the Traverse City Country Club. Contact: Paula M. Dietz, Michigan State University, Department of Crop and Soil Sciences, Soil Science Building, East Lansing, MI 48824.

Since more and more golf courses and other types of clubs are being built in association with **condominium developments**, the Club Managers Association of America will conduct a workshop on the subject in San Jose, Calif., October 9-11. According to workshop chairman Gunter Weihe, "It will not be a workshop on how to operate a club in a condominium complex. It is a program that studies the various forms of condominiums and explores the role of the professional club manager in their management. In addition, it will lay out the opportunities . . . and what a club manager can expect to earn as the manager of a recreation-oriented condominium complex." For details, contact Donna Padgug, workshop coordinator, CMAA, P.O. Box 34482, Washington, DC 20034 (phone 301/229-3600). Official name of the workshop is "New Concepts and Dimensions in Clubs: Condominium Management."

On October 10-11, the **Kentucky Turfgrass Conference** will be held in Owensboro . . . The **Prairie Turf Conference** will also be held those dates in Lethbridge, Alberta, Canada. Contact: Mike Galvin, Box 234, Taber, Alberta, Canada (403/223-2951).

Doral Country Club in Miami, Fla., will be the site of the **National Club Association's 1978 Annual Convention** October 12-15. A new convention format introduced this year will feature serious seminars in the mornings (legal, labor, tax, and financial subjects) and informal sessions and recreation in the afternoons. Contact for details: NCA, 1129 Twentieth St. NW., Washington, DC 20036 (phone 202/466-8424).

O. M. Scott & Sons has announced a

major restructuring in marketing and sales in its **ProTurf Division**. Former ProTurf marketing head George Horn moves to corporate marketing as product line manager, while Director of Technical Services Jim Converse moves to a management post in the marketing/sales organization.

Scott's restructuring of field sales creates two field sales managers to cover the entire United States and Canada: Brian Finger, South/West; and Bill Stinson, North/East.

In another move, Bill Hoopes has been promoted to manager of Scott's Professional Turf Institute.

Ty Weldon Thompson was recently named superintendent of Rancho Las Palmas Country Club's three golf courses in California. He had been golf course supervisor at Canyon CC. When Sunrise Co.'s new Monterey CC development is finished, Thompson will be caring for 54 holes of golf.

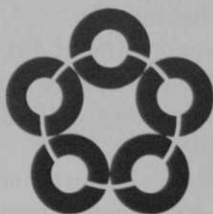
Northrup King Co. has hired two new turf specialists for its Professional Turf Products Department. **Mark Barkhurst** will cover Michigan and Ohio out of Columbus. **Jeffrey Wensman** will be based in Minneapolis and will handle sales in Minnesota, Iowa, Wisconsin, and eastern portions of Nebraska and the Dakotas.

Lofts Pedigreed Seed Co. has added two men to its sales department in Milwaukee to cover the midwestern and western states: **Larry E. Humphreys** and **Kent Reiersen**.

Golf car manufacturer E-Z-Go Textron has named **Peter T. Sadow** director of engineering. He will be responsible for design and development of the firm's golf cars and maintenance vehicles . . . **Jim Kelly** has joined the Outdoor Power Equipment Division of FMC Corp. as light ag/industrial sales manager and will concentrate his efforts on developing the new line of Bolens diesel tractors from Iseki of Japan. **Dave Eckert** has joined the division as director of marketing for the Bolens line of lawn and garden equipment.

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golf business

The six basics of turfgrass establishment

by Arthur Jack Snyder

Golf course architects are required to design and prepare construction specifications for courses in all types of climates and soil conditions. My experiences range from the sandy soils of Tidewater Virginia to the lava-covered slopes of an active volcano in Hawaii.

Since we do have this extreme range of conditions to cope with, it is vital that we make the correct selection of variables in preparing our plans and specifications.

First, we must separate the terms "turfgrass establishment" and "turfgrass development and maintenance." *Establishment* has to do with setting up the environment and materials used, which is the golf course architect's domain; *turfgrass development and maintenance* is the province of the golf course superintendent. The basics to be considered in the establishment of turfgrasses are:

- 1) Climate
- 2) Soil and soil-related problems
- 3) Nutrition and fertilizers
- 4) Soil water — irrigation and drainage
- 5) Planting time
- 6) Initial maintenance.

The first basic: climate

The contiguous United States is generally divided into four regions:

Region 1 — the cool, humid northeastern two-thirds of the country and along the Pacific Ocean in Washington, Oregon, and Northern California where the major turfgrass species

are the bluegrasses, fescues, bentgrasses, and ryegrasses.

Region 2 — the warm, humid southeastern one-third of the country. The main permanent turfgrasses in this area are the bermudagrasses.

Region 3 — the arid and semi-arid southwestern area including the western two-thirds of Texas and the southern sections of New Mexico, Arizona, and California. These are variable, however, according to the elevation. Rainfall varies from 20 inches in Western Texas to less than 5 inches in parts of Arizona and California. Wind velocity in this region is low, averaging about 5 to 6 miles per hour. Golf course grasses used are mainly the bermudagrasses, but bentgrass is frequently used on greens where conditions are right.

Region 4 — the cool, arid and semi-arid area of the West Central and Intermountain regions. Despite the fact that the region is large and the climate rigorous and there is a wide difference in elevations, the same cool season grasses used in the northeast are common to the entire area. One addition I make is Fairway crested wheatgrass. Annual rainfall varies from about 25 inches on the eastern side along the 98th meridian to less than 10 inches in many areas of the drier intermountain plateaus. About 80 percent of the rainfall comes during the spring and summer. Temperatures vary widely.

We cannot do much to change climate. We must learn to live with it, understand its restrictions and limitations, and specify the use of grasses that will prosper in the particular region.

The second basic: soil

We can do something about the soil in which our grasses are grown, although sometimes it is very difficult and expensive to do so.

Of first major importance is the obtaining of soil tests from samples collected throughout the golf course site. From these we can determine what must be done in regard to:

- 1) *Physical properties of the soil.*

Soil tests provide us with a tabulation of the amounts of sand, silt, and clay in the soil, determined by a particle size analysis. Physical properties are important in determining the productivity of the soil since they influence water, air, and temperature relationships as well as soil chemical and microbiological properties.

2) *Chemical properties of the soil.* To the layman and general practitioner this has to do with the pH and the fertility status of the soil. In the arid and semi-arid areas we are interested also in the existence of saline and alkali soils, and we ask for an electrical conductivity reading expressed in milliohms per cubic centimeter at 25°C.

The third basic: nutrition

Soil tests tell us also the amount of nutrient existing in the soil. Grasses are reasonably uniform in the requirement for the major nutrients (nitrogen, phosphorus, and potassium), but soils vary greatly in providing these materials.

In arid regions minor nutrient elements may be a greater problem by being present in toxic amounts or, usually, by being deficient or unavailable because the pH of the soil is too high from excessive calcium, sodium, or other salts. Magnesium levels are important. Iron deficiency chlorosis is very common. To help in the reduction of alkalinity we will use fertilizers containing sulfur, such as ammonium sulfate, potassium sulfate, or ferrous sulfate.

Soil tests help us in identifying nutrients to be supplied; when we know what is in the soil we are better able to specify the correct nutrients. Soil tests for nitrogen, incidentally, are of no practical value.

The fourth basic: water

Turfgrass requires water, whether it falls as rain or is applied through an irrigation system. Even in areas of sufficient natural precipitation, irrigation must be supplied during dry periods. Oahu Country Club in Honolulu normally receives about 150 inches of

Jack Snyder is a golf course architect based in Phoenix, Ariz. A former officer and governor of the American Society of Golf Course Architects, he also belongs to the Golf Course Superintendents Association of America and the American Society of Landscape Architects. In preparing the material presented here, Snyder says he used "almost as a textbook, the book *Turfgrass Science*, a publication of the American Society of Agronomy, as edited by Hanson and Juska."