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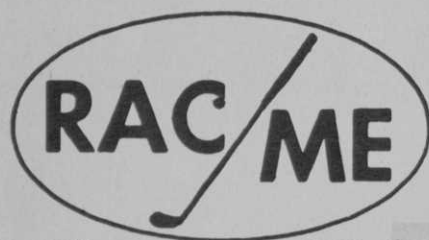
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For more information circle number 148 on card

GOLF BAG STORAGE RACKS



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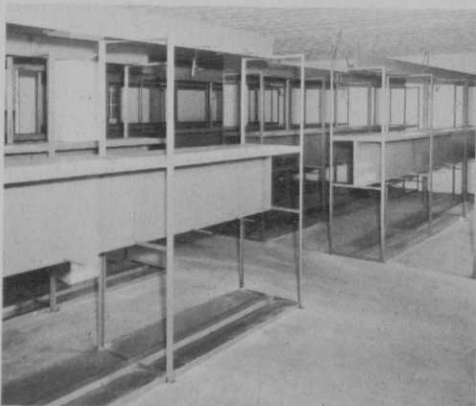
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WE DESIGN YOUR LAYOUT—
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NO OTHER PARTS TO BUY—



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KEN Shop Supplies Help You Give Better Service



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ALSO: Stains, Lacquers, Adhesives, Grips, Listing, Whipping, Shafts, Collars, Plugs, Sheathing, Buffing and cleaning supplies; Golf Club Scales; Official, Lorythmic, Pro-rythmic.

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Light Weight - One Hand



Short handle, light weight. Golfer can rake trap while holding club in other hand.

HIGH DENSITY PLASTIC WEATHER-PROOFED



The bright, yellow-handled RAKE-Ezee Rake flags attention, reminds golfers to rake trap. Stands erect on blunt metal point.

Sturdy, attractive, won't rust, yet low in cost. Rake-Ezee stands erect on point, reminds golfer to rake trap. Fully guaranteed with tough plastic head. See your distributor, or write: >

MFD: BY

NORTH CENTRAL

Plastics INCORPORATED
ELLEDALE, MINN.

For more information circle number 156 on card

OSHA from page 50

cially illuminated with an appropriately lighted sign;

4. Every door that is not an exit, but might be mistaken for one, must be clearly marked to prevent anyone from being trapped in a dead-end space;

5. Special emphasis is placed on keeping halls and areaways and all work areas in and near exits free of obstacles. Inspectors have fined companies that leave packing materials either in these areas or on external ramps and have been extremely critical when these crucial areas have been used for temporary storage.

A considerable body of regulations cover the use of automatic fire control equipment. Much of these regulations are technical and are designed to meet the standards of the National Fire Protection Assn. For clubs, the most important directive is that this equipment must be in a continuously working condition. The same requirement is made of a fire alarm system; if you have one, it must work.

STORAGE

Storerooms must be kept in a clean and hazard free condition. All potential dangers, such as low overheads or projecting valves, must be appropriately marked.

Special storage compartments must be maintained for all toxic cleaning compounds and sterilizers, including those used in swimming pools. These should be marked with the contents and appropriate warning signs posted.

ELECTRICAL

The standards for electrical equipment are extensive.

1. All circuits must be grounded;
2. Although the standards concerned with much of the equipment are currently under revision, it can safely be said that all wiring must include the third grounding post that is often removed from plugs by employees, so that the plugs will accommodate old, non-code wall fixtures and plugs;
3. All extensions must be of commercial or heavy-duty grade. Using household type wiring for an extension cord is a sure way to draw a fine;

continued on page 55



Be a four-star superintendent!

You can if you bring out the best in your golfers. And Agrico can do this for you by building thicker, more colorful, resilient turf grass from tee to fairway to green.

Golf is a darn challenging game regardless of whether the golfer is a duffer or a low-handicapper. He needs all the skill and confidence he can muster. Agrico and you give him a head start on confidence for that good shot.

Thick, rich fairways let golfers get

a good bite into wood and iron shots. Colorful, lush tees condition them for a good start on each hole. Smooth, springy and true greens are essential for better putting.

It all adds up to better total confidence which brings out the best in golfers . . . keeps them enthusiastic about your course . . . makes you a four-star superintendent. Write us about Agrico's Custom-Tailored Golf Course Program. You might be our next four-star superintendent.

Agrico 

Agrico Chemical Company

Tulsa, Oklahoma

*Edison, N.J. 08817
(201) 494-3000*

*Danville, Ill. 61832
(217) 446-0983*

The tournament's tomorrow and Harry's forecasting a cloudburst.

Harry's the club's groundskeeper and a fine weather forecaster, too. Right now he's calling for rain even though the only thing as big as his hand in the sky is his hand.

Because Harry's also the club's rainmaker.

And by pushing the go button on a Certain-teed irrigation system, Harry can order up just the right soak needed to make the ground sparkling and ready for the next day's play.

If you're charged with keeping a brown-out out of the greens, Certain-teed can make everything pushbutton simple for you with a PVC/AC irrigation system. "PVC" and "AC" stand for polyvinylchloride plastic pipe and asbestos-cement pipe. Each does its own thing best: PVC for small, AC for large pipe diameters. Both are tough, rust- and corrosion-proof, and easy to install. You get FLUID-TITE® or deep-socket solvent-weld joints that speed connecting and never leak.

Whatever's best for your greens, you can get it all from one source—Certain-teed. Which means coordinated deliveries, good service, and everything working together. Ask your contractor to put Certain-teed into your irrigation plan specs. You'll never have another game cancelled for lack of rain.



**Pipe & Plastics
Group**

CERTAINTEED

A DIVISION OF CERTAIN-TEED PRODUCTS CORPORATION

Valley Forge, Pa. 19481

The Reliable Rain Makers

OSHA from page 52

4. All wiring must be in good condition and of the proper type. Rubber insulated cords cannot be substituted for flexible cable; flexible cable cannot be substituted for conduit when required by the code.

Particular attention should be paid to these directives in the golf shop, where extension cords and the grounding of equipment is frequently faulty. This equipment, which is often installed on the spur of the moment by a club cleaner or assistant, can be particularly dangerous when used by inexperienced help. The same conditions are likely to exist in the locker room where attendants make temporary repairs to polishing and buffing equipment. Similar attention, particularly to grounding pots, should be paid to such equipment as vacuum cleaners and floor polishers. In storage areas, lightweight, household extension cord is frequently used to string temporary light bulbs. This type of wiring is inadequate.

FIRST AID, MEDICAL

As on the golf course, approved first-aid kits must be maintained in appropriate areas. Special attention should be paid to replacing their contents, which are often depleted without the knowledge of supervisors.

STAIRWAYS, LADDERS

The existing regulations covering stairways and ladders are too extensive to include here, even in review. In general, common sense safety is the primary requisite. Some of the more important regulations are:

1. All ladders must be safe and have no damaged or broken rungs;
2. All ladders must have safety feet;
3. Ladders that might be considered dangerous must be marked;
4. Metal ladders must be free of all hazards, such as sharp edges or burrs;
4. The rope used with the pulley on extension ladders must be not less than 5/16 of an inch in diameter, with a minimum breaking strength of 560 pounds;
6. All stairways must be equipped with handrails not less than 29 inches high;
7. All stairways must be in good re-

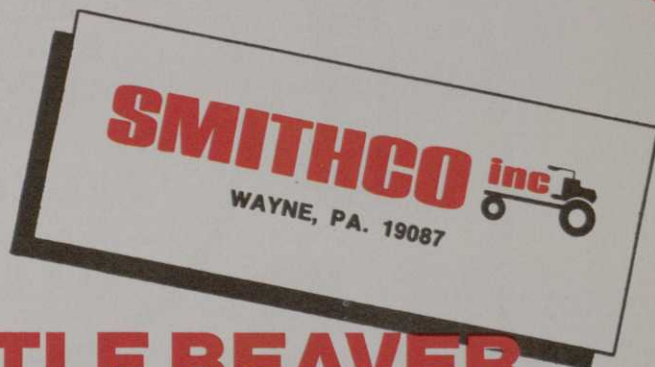
pair, kept clear and unobstructed. Treads must be uniform and in good condition.

EQUIPMENT

Many clubs maintain repair and maintenance shops in various degrees of completeness. These should review the many standards covering lathes, grinders, welding equipment, woodworking tools and other maintenance equipment covered in the Nation Club Assn.'s OSHA Manual.

Every club that has not already done so should immediately insti-

tute a program to bring their entire physical plant into compliance with safety and health standards. Delay would, at best, produce only administrative problems and possible fines; at worst, serious injury to employees. Furthermore, club officials should be aware of the direct benefits that affect their members from any improvement in the safety conditions on the club grounds. Lastly, all club officials should also be aware and make use of the assistance available to them through GOLFDOM and the National Club Assn. □



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RED RIDER
Easiest loading, easiest operating and most durable workcart in America



TOP RIDER
The only riding top dresser—three times faster than any other top dresser.

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keep greens greener!

SMITHCO'S big three—featuring the **LITTLE BEAVER** has to be the first team of turf maintenance equipment. **LITTLE BEAVER** greens spiker is the fastest riding spiker anywhere! Spikes 18 holes in 2½ hours. Turns on greens without ripping. They all have the interchangeable big red power heads. Check **Smithco's REDHEADS** when you want greener greens.

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HUMUS...THE TRUE NATURAL ORGANIC**



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- Grows everything - better
- Builds stronger, healthier turf

THE SEWERAGE COMMISSION P. O. BOX 2079 • MILWAUKEE, WISCONSIN 53201



SOIL TESTING: PROTECT YOUR GREENS INVESTMENT

by JUDITH STEWART

LABORATORY MANAGER
AGRI-SYSTEMS OF TEXAS, BRYAN, TEXAS

Considering that \$10,000 may be invested in one green, a superintendent should know enough about soils testing to realize its value

My occupation is the physical testing of soils and organic materials to be included in the top 14 inches of golf course greens. The usual reactions to this statement are: 1) Huh? or 2) Why? I answer the second question with an explanation of basic soil physics, a brief statement on the proper culture of turfgrass and the disclosure that an average green costs \$10,000 and a bad seedbed mixture can make it useless within a few months.

It would be nearly impossible here to list all the factors involved in a soils analysis. Every situation varies. Two recent samples, one from the St. Louis area and one from central Texas, are typical of the problems we run into, so I will use them as examples.

The plastic-bagged samples from St. Louis included a very good sand, which is noted as expensive, a sand with too much material over 5mm. (but which is preferred, because it is cheap), an extremely silty soil, and bags of reed sedge peat and sphagnum peat moss. Incidentally, peat is the correct name for everything except sphagnum, which is a moss. The sphagnum is ruled out immediately; the fibers are too long to mix well and it breaks down more rapidly than other types of peat.

The first step in processing is to dry the sand and the soil. The soil is then pulverized. A mechanical

analysis using the Bouyoucos hydrometer method reveals that it contains 41.7 per cent silt, 22.6 per cent clay and 35.7 per cent sand. There is too much silt in this sample. Clay particles will aggregate, forming a larger stable particle with less tendency to drift. Some silt particles will be enveloped in the clay aggregate as long as the balance is roughly equal. If there is considerably more silt than clay, as in this case, the clay will bind some of it, but the remainder will gradually be washed to the bottom of the seedbed mixture. There it will form a layer less permeable than concrete. Water ceases to drain properly and the grass dies. This can occur in less than a year after the putting green is completed.

In preparing soil for a hydrometer test, we use a dispersing agent that breaks down existing clay aggregates. If this procedure is not done, the aggregated particles will behave like sand in the tests and will be recorded as sand. We also use a malt mixer to help break down these aggregates. Our experiments have shown conclusively that omitting either of these steps can mean a difference of as much as 26 per cent in the figures. That is trouble in anybody's book.

During the two hour wait between the first and second hydrometer readings, the two sands are sieved. Our screens come in millimeter sizes, beginning with 5mm., 2mm., 0.5mm., 0.25mm. and 0.125mm., and a catch pan that holds material less than 0.125mm. A good sand to be used with a good soil should have more than 50 per cent of its particles in the range of .25mm. to 1mm. These two sands break down like this:

continued on page 58

Retained on:	Expensive sand	Client's preferred sand
5 mm.	.4	8.4
2 mm.	4.8	12.3
1 mm.	17.9	31.7
0.5 mm.	36.8	30.8
0.25 mm.	32.6	10.4
0.125 mm.	6.4	4.1
Less than 0.125 mm.	1.1	2.3
	100.0%	100.0%

WINTER INJURY and SNOW MOLD

...have one thing in common

**THEY ARE MORE SEVERE IN
AREAS OF POOR DRAINAGE**



JACK FROST

SAYS... "AQUA-GRO
CAN SAVE YOU TIME
AND MONEY - IT'S
PURE HELL TRYING
TO DAMAGE AQUA-GRO
WINTERIZED GREENS"

AQUA-GRO

... moves excess water out, prevents overly wet areas that encourage snow mold and winter injury. Apply 8 oz./1,000 sq. feet to green in late fall for winter protection.

AQUATROLS CORPORATION of AMERICA
P. O. BOX 385 DELAIR, N. J. 08110

For more information circle number 154 on card

SOIL TESTING *from page 57*

In this case, the more expensive sand must be used with the silty soil. I have talked to the man who sent the sample and have found that no other soils are available. Even if both sands were acceptable by the normal criteria we use, the more expensive one must be used for this reason. Picture a large container full of basketballs. Now drop a handful of marbles into the container. The marbles wind up at the bottom. Now picture the container full of golf balls. Drop in the handful of marbles. The marbles stay almost where they were dropped.

The free silt in the soil corresponds to the marbles. In the sand in which larger particles dominate, the silt will have nothing to slow its drift and will travel immediately to the place where it can do the most harm. With the other sand, the larger proportion of small particles acts the same as the golf balls. Another disadvantage in using the less expensive sand is the mixing problems that occur with its use. The larger particles will invariably wind up on top of the mixture, which creates mowing, cup cutting and maintenance problems. In this case, the more expensive is less expensive.

The only possible mixture for these samples is seven parts sand, one part soil and two parts peat, by volume. Acceptable silt-clay ratios in a finished mix range from 4 to 9 per cent. This mixture's ratio will be about 6 per cent: 4 per cent silt and 2 per cent clay.

The materials are mixed in these proportions, placed in collard cylinders, tamped and soaked. After soaking, they are placed on a tension table and left until the weight of the sample reaches a level at which it will remain constant. This condition of moisture approximates "field capacity." The cylinders are then compacted and the collars removed. Compaction creates conditions similar, but not identical, to those in a putting green eight to 10 years old. The balance of organic material would be different after this period of time.

The compacted mixture is weighed and resaturated. When total saturation is achieved, the mixtures are weighed again and are

placed on a permeameter. After permeability rates have been measured, the samples are oven dried and reweighed. The difference in saturated weight and field capacity is the percentage of non-capillary pores; the difference between field capacity and oven dry weight is capillary porosity.

This mixture has a permeability rate of 4.94 inches per hour, large pores comprise 22.45 per cent, small pores equal 20.62 per cent.

The sample from central Texas presents a very different set of problems. The people who sent the sample are on a tight budget, the local soil is a very heavy clay, good sand is very expensive. So is the peat moss. They did have a dirty sand available, and a choice of composted cotton burrs or fresh sawdust for organic material.

What we call "dirty" sand can be found in almost every part of the country. We are sometimes lucky enough to find that such a sand has a silt-clay ratio within the limits set for standard mixtures.

This dirty sand tests out as 92.4 per cent sand, 3.6 per cent silt and 4.0 per cent clay. Nearly perfect. Of the organic materials, the composted cotton burrs are best.

This mixture will consist of eight parts dirty sand and two parts composted cotton burrs. This saves a step in mixing; there are no clay lumps, which are difficult to distribute properly, and it is inexpensive. The final figures on this mixture are 5.26 inches an hour permeability, 23.8 per cent large pores and 20.11 per cent small pores.

A word should be added here that the permeability figures assume that 5.26 inches of water per hour are put on a green at one time. This is rarely done. One of the effects of greens built to the USGA specifications is that the different textural layers fill almost completely before passing into the next layer.

This is a strange business, requiring equipment, skill, knowledge, a loud voice and a considerable obstinacy. And we do not have all the answers. We find new ones daily. But we have seen vociferous opponents turn to believers and good friends, and in 10 years we have never had a complaint where our advice has been followed. □



Dacthal[®] drives crabgrass and *Poa annua* off the course.

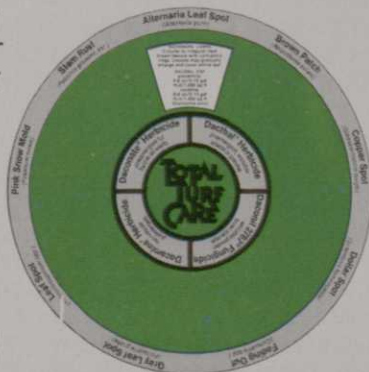
Dacthal preemergence herbicide drives out over 20 annual grassy and broadleaf invaders, including crabgrass and *Poa annua*. It *prevents* weeds—kills the seeds as they germinate.

One application in early spring controls most problem weeds. Spray Dacthal W-75 wettable powder. Or, spread convenient G-5 granules. Either method does the job. Just read and follow label directions.

Dacthal won't leach out with frequent waterings. Yet, it degrades in one season... is *not* persistent in the soil!

Send coupon for a helpful Total Turf Care dial on turf diseases and weeds. Just dial your problem, read the answers.

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G-9

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City _____ State _____ Zip _____

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WANTED - P.G.A. PROFESSIONAL. Please send complete background resume, qualifications and salary required. Private Club. CYPRESS LAKE COUNTRY CLUB, 6767 Winkler Road, Fort Meyers, Florida 33901.

WORKING GREENS SUPERINTENDENT - 5 years experience. Advise salary requirements. Write: H. REPKA, Darien Country Club, Darien Center, N.Y. 14040.

WANTED - EXPERIENCED MANAGER. Country club dining room and lounge. Beautifully situated. New three bedroom living quarters. P.O. Box 422, Raton, New Mexico 87740.

GREENSKEEPER SUPERINTENDENT - private club, 9 hole course, future expansion to 18 holes. Near Dover, Delaware. State experience, salary desired, etc. Write Box 902, c/o GOLFDOM.

SALES REPRESENTATIVES WANTED - Ladies Soft Goods. Only experienced need to apply. Many territories open. Up to 15% commissions. Write SALES MANAGER, P.O. Box 84, Liberty, Indiana 47353.

JOBS WANTED

GENERAL MANAGER—Qualified: via Academics, Experience and Association i.e. PGA, GCSA. EVERY FACET. Above average: Professional, Greens Superintendent and Club Manager. (717) 775-6215.

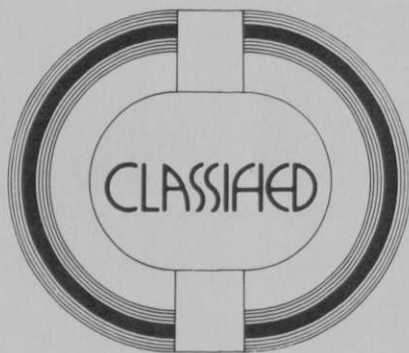
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USED GOLF CAR CLEARING HOUSE. We have every make and model golf car in stock. If we don't have the golf car you want we will get it. Write or call collect for the golf cars of your choice. As is or reconditioned. Any quantity at the lowest possible prices and we handle the freight. NEDA Northeast Dealers Association, 420 Penn Street, Spring City, Pa. 19475. (215) 935-1111.

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GOLF COURSES: Want to buy a golf course? Want to sell a golf course? Write to us—we specialize in Golf Course transactions. Ask for Golf Consultant. McKay Realty Co., 15553 N. East St., Lansing, Michigan 48906.

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ANY IDEAS, INVENTIONS, INNOVATIONS that pertain to golf, write us... we sell, manufacture and distribute. Write Box 903, c/o GOLFDOM.

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WALL RACKS. Green Plastic. Includes mounting screws. Holds 10 Irons, 4 Woods. Packed 6 to carton. \$30.00 F.O.B. Box 1111, Kendall, Fla. 33156.

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