Any soil with a winter frost line can put the chill on your watering system. The best way to minimize trouble is to install cast iron pipe—like the tournament courses do.

Freezing conditions are one thing. Other hazards to a water system are pressure and water hammer. Cast iron pipe can take more of both. So, if you should want to add nine, eighteen or thirty-six holes, you would find your cast iron system readily extendable and expandable.

Use all the sprinklers you want! Just tap the pipe and add where needed. Cast iron pipe taps clean every time. Gives you strong strip-proof threads—instead of a tearing pain in the ledger.

Cast iron pipe can also be dug up, moved and re-used. Don't try that with substitute pipe.

Of course, cast iron pipe's big feature is its longevity. You can bury corrosion-resistant cast iron pipe and forget it. Many cities and towns receive water through cast iron pipe 100...200...even 300 years old.

And it also helps to know that you don't have to hold your breath when your crew drives loaded trucks over your pipe lines.

Why worry through another winter? Cure pipe colds. Warm up to cast iron pipe.

CAST IRON PIPE
CAST IRON PIPE RESEARCH ASSOCIATION Suite 323• Executive Plaza East 1211 West 22nd Street• Oak Brook, Illinois 60521
An association of quality producers dedicated to highest pipe standards through a program of continuing research
THE MARK OF PIPE THAT HAS SERVED OVER 100 YEARS IN OVER 100 CITIES
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Get free help with your irrigation system plans. Industry's most complete booklet has vital design and installation tips, and other planning aids (20 pages). Write for your copy of booklet A-27 "Golf Course Irrigation."

For more information circle number 194 on card
When the name of the game is a better putting surface... the name on the green is

**Hahn**

WEST POINT

Good golf requires perfect greens. And perfect greens require care — the kind of care West Point Products provide. Precision equipment like this threesome — just part of West Point's Complete Line designed to prove that we really care for your course.

- The West Point VC-5 Verti-Cut® (right) is a precision vertical mowing machine developed by West Point as the ultimate solution to "grain" and thatch development. Thirty razor-sharp vertical blades (60 cutting tips) revolving at high speed slice flattened, grain-producing grass blades in 19" swaths. And, this popular machine also promotes finer turfgrass by helping control weeds and diseases... by making fertilizers and top dressing more effective. A unique anti-scalping roller permits micro-depth adjustment of the blades. Request Bulletin 6840 for complete details.

- The West Point MC-5A Vertifier™ (left) is the ideal aerifier for relieving green compaction. It cuts clean cores at a good clip—100 feet per minute in 16" swaths—so that you can easily cover 10,000 square feet in an hour. High speed tines cut and remove cores while special rubber "flexi-pads" prevent turf damage. The catcher attachment keeps cores off the green and, to speed the job, a hydraulic lifting device permits rapid, even turning without scuffing the turf. Request Bulletin 6891 for complete details.

- The West Point PD-2 Power Drag™ is a real time-saver for matting top dressing into greens. This three-gang rig makes it possible for one man to mat a green in ½ the time, taking a wide 9½' swath. Each mat is made of flexible ribbon steel, heavily galvanized in a unique continuous crimp pattern. This special design provides an exclusive swirling action that works top dressing and fertilizer right down to the soil surface. And, the mats fold together conveniently for easy transportation and storage. Request Bulletin 6858 for complete details.

Hahn Lawn and Turf Products
A Division of Kearney-National, Inc.
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Evansville, Indiana 47717
Greenskeeper's Unite! Have some fun for a change. Golf was made for FUN®. And FUN fertilizer will keep you, and the golfers, smiling. Your greens will stay rich in color and growth all season long—and changeovers will hardly be noticed.

Use new WIN™ fertilizer on fairways and your whole course will come alive, year 'round. Both FUN and WIN are specially formulated for your golf course. Contact your Reliance man—for free soil sampling, free recommendations and a free wall plaque of the Greenskeeper's Lament.

Write Kaiser Agricultural Chemicals, Reliance Specialty Products Division, P.O. Box 529, Savannah, Georgia 31402.

KAISER
AGRICULTURAL
CHEMICALS

The Greenskeeper's Lament

O give me a course
Where no patches of brown
Mark the grave of changeover grass.

O give me a course
Where no golfers frown
On greens "as slick as glass."

O give me fairways evergreen,
Let my Eden grow,
One bad lie on all eighteen
Can make a temper blow.

O let my course so verdant be,
So manicured and trouble-free
That someday some great sport will say,
"It's not your fault
I shot a hundred and three."

For more information circle number 100 on card
Merion tillered more profusely than Windsor but Windsor produced a greater number and length of rhizomes. Tilling was greater under medium photoperiods than under longer or shorter periods of light exposure. Both Merion and Windsor produced about the same number of developed crown buds, but Merion produced a greater number which developed into tillers while Windsor produced a greater number which developed into rhizomes.

Seasonal relationships between nitrogen nutrition and soluble carbohydrates in the leaves of Agrostis Palustris Huds and Poa Pratensis L.


(from the Department of Crop Science, Michigan State University, East Lansing, Mich. 48823).

Toronto creeping bentgrass and Common and Merion Kentucky bluegrass were fertilized at rates of 0, 3, 6, 9 and 12 pounds of nitrogen per 1,000 square feet per year, which were split into six equal applications made at 15 day intervals starting April 15. In a second experiment conducted in mid-August, 0, 6 and 12 pounds of nitrogen per 1,000 square feet were applied to each of the three grasses in a single application. The effect of these nitrogen fertilization treatments on the sucrose, glucose, fructose, fructosan and oligosaccharide contents of the leaf tissue were investigated.

The short chain oligosaccharides containing predominantly fructose units were the primary storage carbohydrates in these three grasses and proved most responsive to nitrogen treatments. The oligosaccharide content decreased as the rate of nitrogen fertilization increased. The nitrogen treatments did not produce significant responses in the sucrose and monosaccharide (glucose and fructose) fractions. The article continued on page 19.
BUCKNER MODEL CP-2 CENTRAL PROGRAMMER... MAJOR BREAKTHROUGH IN CENTRAL CONTROL

"Total control" is here.
With the Buckner CP-2 Dual Central Programmer, up to 600 individual sprinkler stations can be controlled from one location. The CP-2 can be operated automatically, semi-automatically or manually with 14-day programming.

Syringe an 18-hole golf course in less than an hour.
Only with the Buckner CP-2 Dual Central Programmer do you get an infinitely adjustable syringe cycle (1.7 to 5.0 minutes). You can override all programmed timing to syringe for dew or frost control with the flick of a switch. An 18-hole course can be in playing condition in less than an hour. This feature alone makes other central programmers seem like crude prototypes.

Sophistication means simplification.
The CP-2 is the ultimate in sophistication. It controls up to 30 Field Controllers from each of two separate and independent sets of controls. It offers adjustable station timing, 0 to 60 minutes, for different soil and turf conditions; instant "off" of all stations when "omit" is desired; automatic starting and stopping of pumps. An automatic rain switch is available.

This sophistication in the CP-2 Dual Central Programmer led to the design of a less complex, low cost field controller, the FC-10. The FC-10 simply activates up to 10 stations at the command of the central programmer for the programmed time.

Compare Central Control with conventional design.
On a typical 18-hole course, a conventional automatic system would require 12 No. 711EP controllers to operate 143 automatic valves. Each valve on the greens and tees would be on a separate station, but two of the fairway valves would be manifolded together on each station. Each controller would have its own timing program.

The same course, with a CP-2 system, has 23 FC-10 Field Controllers, reducing the distance between valve and controller. All Field Controllers are wired, by a 2-wire system, into the CP-2 Central Programmer, where operation is controlled. The superintendent can quickly and easily check every sprinkler from the Field Controllers, because they are closer to the valves.

FC-10 FIELD CONTROLLER

A CP-2 system costs $530 less.
The CP-2 system costs less to install on this course for several reasons. First, because the FC-10 Field Controllers are simpler, they are less expensive. And because they can be installed closer to the sprinklers they control, more than 40,000 feet less control wire was needed in this installation. So the total installation cost was $530 less than for the conventional system.

A CP-2 Central Control system costs less to operate, too, because it requires less time, less manpower. "Total control" is achieved by one man, from one place. There's no need to make the rounds of remote controllers, except for occasional inspection. You apply water only when you need it, only in the quantity required.

We can show you the advantages of having a Buckner CP-2 Dual Central Program system. Send in the coupon, and we'll arrange a demonstration.

BUCKNER MODEL CP-2
A Division of General Sprinkler Corp.
909 W. Nielsen Ave., P.O. Box 232
Fresno, CA 93708

Here's my name and phone number. Please arrange a demonstration of the CP-2 Dual Central Programmer.

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For more information circle number 200 on card
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First in the 70's!

with new ideas for turf utility equipment

NEW... an even better Red Rider!

More driver comfort... ten new features. New drive chain take-up for longer chain life. Most reliable, most dependable work cart in the country. First in the 70's!

NEW... Red Rider's Spray-Mate!

An all-new, low volume sprayer for greens, tees, trees. Spray-Mate is a self-contained, 4-wheel, piggy back sprayer that needs only one man to load and operate. Fifteen-foot boom and fifty-foot hose with nozzle included. Has 65-gallon fiberglass tank, pump that generates 500 psi.

NEW... "Big Red"—an even bigger Red Rider!

Extra-wide Red Rider carries more men and equipment to more places with fewer trips. BIG RED easily handles the widest aerator or three greensmowers on its 56" broad deck. It's the biggest machine and biggest bargain on the fairways. BIG RED costs only slightly more than our regular RED RIDER.

All Red Rider utility equipment is designed, engineered and manufactured solely for golf courses and other large turf areas.

ANOTHER REASON WHY YOU CAN BE "FIRST IN THE 70's," WHEN YOU GO WITH SMITHCO.

For more information circle number 179 on card

SMITHCO INC.
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Standard unveils new tee console...
features Cycolac professional ball washer!

Standard presents the golfers delight...a compact tee unit that lets you wash your golf ball, dry the ball, clean your spikes and toss away debris...all in one convenient place. And we haven't forgotten the golf course superintendent. This unit is easily portable when mowing time comes. You can throw away your trimmers because you simply pick up the console...weighs only 36 pounds...mow and then replace the Standard Console. And you move the Console around the tee to eliminate killing the grass. Steel spikes anchor the console.

The Professional ball washer is made of Cycolac®...the special plastic that's hard, tough, rigid, won't stain, dent, peel, chip, rip, rust or fade. It's cold-proof, shock-proof and crack-proof. It's the same material all NFL football teams use in their helmets. So you can see it's not an ordinary plastic. Give it the hammer test...and see for yourself. The Standard Professional ball washer features a Cycolac® case, lid and handle. Besides the bright, yet distinctive color, it does an excellent job of putting a sheen back on to golf balls.

See the new Standard Console and Cycolac® Professional ball washer at the Houston golf equipment show in February. See for yourself how you can put some more color and class on your golf course. Or write for FREE, colorful literature today.
And you know how good that is. You see more and more Harley-Davidson golf cars on America's top courses. We build Utilicars with the same care, the same idea that only "perfect" will do. The same way we've been putting power on wheels for over 66 years. That's why they're such hard-working, long-lasting cars. So economical to own and operate.

And why they're so widely accepted for industrial uses. Choose from six body styles, cabs and other options to match your jobs. Choose gasoline power with simple, reliable automatic transmission plus instant-ignition starting that ends wasteful idling. Or choose electric drive that works far longer between charges, prolongs battery life. Get a demonstration today from your Harley-Davidson dealer ... the place to go for fast, dependable service, too. Or write: Manager, Commercial Car Division, Harley-Davidson Motor Co., Inc., 3700 West Juneau Avenue, Milwaukee, Wisconsin 53201.

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The only work car as good as our golf cars.
Application of more than 1.5 pounds of nitrogen per 1,000 square feet resulted in severely depressed oligosaccharide levels. Based on these carbohydrate responses, no more than 1.5 pounds of readily available nitrogen per 1,000 square feet should be used in any single application.

The common Kentucky bluegrass went into mid-summer dormancy for a period of time. During that period there was no reduction in the oligosaccharide level. However, there was a depletion of the monosaccharides, glucose and fructose, which coincided with the advent of the summer dormancy. A similar response was observed with Pennlawn red fescue.

Comments: A delicate balance exists between the storage carbohydrate level of the turfgrass tissues and the level of nitrogen nutrition. A vigorous, healthy turf should contain a quantity of reserve carbohydrates at all times. This store of food reserves is then readily available to support growth, particularly following environmental stress, disease or insect damage. A rapid recuperative rate from this type of injury is desirable and can best be achieved by utilization of carbohydrate reserves stored within the turfgrass plant.

An excessive amount of nitrogen nutrition which stimulates shoot growth will deplete the carbohydrate reserve. Since the shoot tissues always have priority over the root tissues for any available carbohydrates, there may actually be a restriction and dieback of the root system. In addition, the lack of a carbohydrate reserve will impair the recuperation from injury.

The above study indicates that applications of readily available nitrogen at rates in excess of 1.5 pounds of nitrogen per 1,000 square feet in any application will severely restrict the carbohydrate reserve and should be avoided.
MOST UNWANTED

POA ANNUA
Aliases: Jekyll- &- Hyde grass, annual bluegrass

GOOSEGRASS
Aliases: crow foot, silver crabgrass

Hairy Crabgrass
Alias: large crabgrass

Smooth Crabgrass
Alias: small crabgrass

Barnyardgrass
Alias: watergrass

Green Foxtail
Alias: green bristlegrass

Yellow Foxtail
 Alias: yellow bristlegrass