

# pipe colds



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

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# When the name of the game is a better putting surface... the name on the green is



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 ma-

chine also promotes finer turf-grass 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 attach-

ment 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 1/3 the time, taking a wide 9 1/2' 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.



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Use new WIN<sup>(TM)</sup> fertilizer on fairways and your whole course will come alive, year 'round.

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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.

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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."





by Dr. James B. Beard

## TURFGRASS RESEARCH REVIEW

### How photoperiod, cold treatment affect rhizome and tiller development

**Rhizome and tiller development of Kentucky bluegrass (*Poa Pratensis* L.) as influenced by photoperiod, cold treatment and variety.**

L. E. Moser, S. R. Anderson and R. W. Miller. 1968. *Agronomy Journal*. 60:632-635. (from the Department of Agronomy, Ohio State University, Columbus, Ohio 43210).

The affects of photoperiod and cold treatment on the rhizome and tiller development of Merion and Windsor Kentucky bluegrasses were studied in controlled climate chambers. The photoperiods utilized in this study lasted six, 12 and 18 hours. The low temperature treatment was just above freezing.

Although a cold treatment is not essential for lateral shoot development, it did stimulate tillering but reduced the numbers of rhizomes initiated. Longer photoperiods of 16 to 18 hours resulted in increased rhizome initiation and elongation. In comparing the two varieties utilized in this study,

Merion tillered more profusely than Windsor but Windsor produced a greater number and length of rhizomes. Tillering 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.

D.G. Green and J.B. Beard. 1969. *Agronomy Journal*. 61:107-111. (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 predominately 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 ap-

continued on page 19

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# 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.

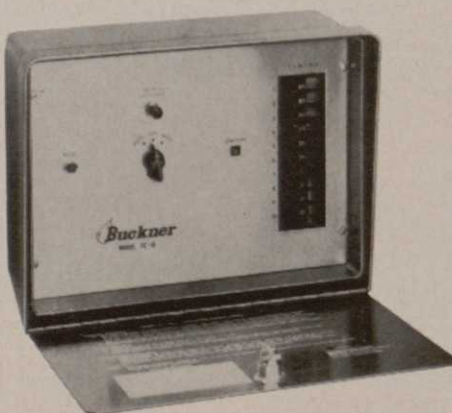
On a typical 18-hole course, a conventional automatic system would

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.*

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Here's my name and phone number.  
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### **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 fiber-glas tank, pump that generates 500 psi.

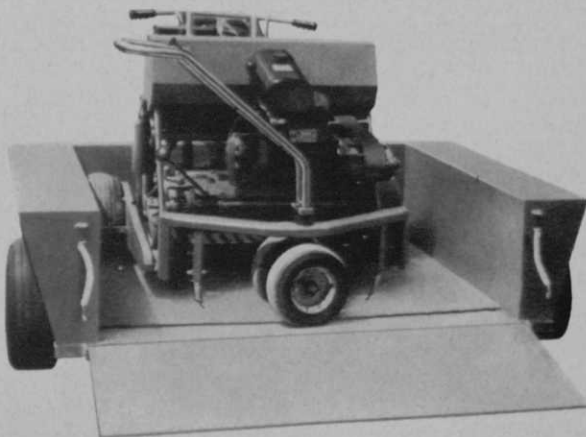
### **NEW...“Big Red” – an even bigger Red Rider!**

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.

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color on your  
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by Standard  
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# Standard unveils new tee console... features Cyclocac® 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 Cyclocac® . . . 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 Cyclocac® case, lid and handle. Besides the bright, yet distinctive color, it does an excellent job of putting a sheen back on to golf balls.

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## Harley-Davidson

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## BEARD

continued from page 14

plication 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. □

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# MOST UNWANTED



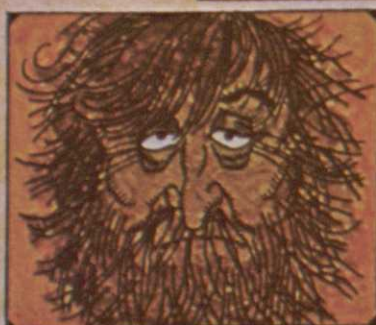
**POA ANNUA**

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