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 threadsinstead 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.





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GRAU

Continued from page 38

A.—Maleic hydrazide is the only one that I would consider economical the way you intend to use it. The last three are strictly for floral and horticultural use and are not useful for grass and weeds.

Yes, MH will be more effective on new, young growth, but to save mowing it may be applied just after an area has been mowed. MH will not control all vegetation equally. There will be some types that will be affected very little, which will require a certain amount of mowing.

Q.—We have Pythium and it is severe. We have used all of the newest fungicides that are claimed to "knock the fungus cold." Right after we spray—we get a hot shower (95°F.) and the Pythium keeps right on rampaging. We are way over our chemical budget now. Is there any relief?

(Indiana-Maryland)

A.-At the risk of upsetting a dozen or so pathologists I am suggesting a spray (or dust) of hydrated lime in between applications of chemicals. Rate: one-half pound to 1,000 square feet. Apply in evening, rinse it off next morning. The instant change in pH in the micro climate (to as high as 9.5) can subdue the fungus. Hydrated lime is a temporary expedient-no more permanent than the fungicides. Many superintendents have said that, "the only cure for Pythium is a change in the weather." This fungus works only at high temperatures and when moisture is in abundance.

Q.—Where can we get some literature on Penncross bent? We would like to know more about how it is produced.

(California)

A.—Drop a line to Penncross Bentgrass Growers Assn., 4491 Liberty Road, South, Salem, Ore. 97302. Ask for their flyer on Penncross bentgrass.

For more information circle number 256 on card

Spray NITROFORM® by using POWDER BLUE*

The same 38-0-0, the same nonburning, long-lasting organic nitrogen, Powder Blue* is the sprayable form of Nitroform[®].

The fine particles can be suspended in water to penetrate the closely knit turf and eliminate mower pickup. Compatible with pesticides and other fertilizer ingredients, Powder Blue can be sprayed

as a part of the greens maintenance program. Use of Powder Blue is especially recommended in the summer months when greens care can be so critical...because it's nonburning, laborsaving, and gives uniform coverage.



Turf & Horticultural Products, Hercules Incorporated, Wilmington, Delaware 19899

For more information circle number 233 on card

The Delicate Art of Turfgrass Cultivation

These methods of cultivation can bring new vitality to a course, but only if certain procedures are followed I he cultivation of turfs is not possible as normally practiced in ornamental and horticultural crops. The term cultivation refers to mechanical methods of selectively tilling an established turf without destroying the sod characteristics. Because one of the key criteria in turfgrass cultivation is minimum damage to the turf, it is very difficult to achieve through cultivation of established turfgrass soils. The term aerification has been used as a synonym for turfgrass cultivation; it is misleading because it emphasizes improved soil air movement, whereas in fact, improved water movement may be as important or even more important under many turfgrass soil conditions.

Types of cultivation

There are five primary types of turfgrass cultivation: (a) coring, (b) grooving, (c) slicing, (d) forking and (e) spiking. Each provides a specific type and degree of cultivation.

Coring uses a hollow tine or spoon to remove cores, which results in a hole or cavity remaining in the turf. The normal depth of penetration from coring is three to four inches with the cores located on two, four, five or six inch centers. The actual diameter of the tine or spoon and resulting care varies. The cores may be broken up and



worked back into the surface. Core removal is done either by sweeping or collecting in a box mounted at the rear of the coring unit. Following removal of the cores, the area is normally topdressed and the soil worked into the holes by matting. If the cores are returned, a vertical mowing unit is utilized to chop up the cores, particularly on greens. Then a steel mat is dragged over the surface to work the soil into the holes.

Grooving uses vertical rotating knives or saw teeth which cut vertical slits through the turf into the soil. The knives rotate in either the opposite or same direction as the direction the machine is traveling. Grooves up to four inches deep are possible. Grooving is frequently practiced for dethatching and over-seeding, since a considerable quantity of soil is lifted to the surface which acts as a topdressing over the turf. In general, a fairly dry soil is preferred for the grooving operation.

Slicing uses a deep, vertical cutting action which provides soil openings and loosening for improved air and water movement. It is accomplished with discs or ridged, V-shaped knives which are mounted on circular, weighted wheels. The slicing unit is pulled across the surface of the turf and the discs or knives penetrate the soil. Penetration is to a depth of three or four inches, but soil is not removed. Slicing is best accomplished on moist soils.

Forking involves the use of a fork or solid tined device for the cultivation of compacted soils. It may involve either powered or manual operation. Forking usually permits cultivation to a depth of six to eight inches with a minimum disruption of the surface. The use of forks for manual cultivation of localized dry spots is a common practice on greens.

Spiking involves the perforation of the turfgrass surface by solid tines or blades. The design and weight of the spiker results in a shallower, less effective cultivation than is achieved by grooving, slicing or coring. Spiking should be used for temporary alleviation of a surface compaction problem. It can be done with a minimum disruption of the playing surface which can be an advantage under certain conditions.

Benefits

Basically, turfgrass cultivation is a mechanical method of improving the exchange of air and water between the atmosphere and the soil. Water and oxygen move downward into the soil while carbon dioxide and certain potentially toxic gases *Continued*





Examples of the types of cultivation: coring (opposite page); slicing (left) and spiking (above) are shown here on bentgrass greens.

Cultivation Continued

move upward out of the soil into the atmosphere. The enhancement in air and water exchange resulting from cultivation is greatest on compacted, fine textured soils which have been subjected to intense traffic. Deep cultivation also permits the penetration of fertilizers and lime to greater soil depths.

Other beneficial affects of cultivation include a decrease in the

"Generally, cultivation practices on greens tend to increase the velocity of ball roll."

amount of water lost by surface runoff and an associated increase in infiltration of water into the soil. Under certain conditions, an increase in the water holding capacity of the soil has been observed which reduced the frequency and amount of irrigation required. Deep cultivation of compacted soils can improve the resiliency in the soil and will also stimulate thatch decomposition. The increased rate of thatch decomposition is greatest when soil is brought to the surface to function as a pseudo-topdressing.

The net affect of the improved soil environment resulting from turfgrass cultivation is to encourage a deeper, more extensive root system. An increase in shoot density may also be observed. A further beneficial affect of cultivation is the severing of numerous stolons and rhizomes which results in a stimulation of young, juvenile growth. This is desirable since it improves the overall vigor and quality of the turf.

Cultivation can also be used for overseeding or turfgrass renovation practices. One of the most important principles in achieving adequate seedling establishment in established turfs is providing good contact between the seed and soil. This can best be done through turfgrass cultivation and, at the same time, provide a minimum degree of disruption to the existing desirable species.

Potentially detrimental aspects

In the case of golf course greens, cultivation does disrupt to a certain degree the smoothness and quality of the putting surface. The disruption is greatest if a core or quantity of soil is removed. For this reason, it is usually necessary to topdress greens immediately after cultivation followed by a second topdressing two to three weeks later. Generally, cultivation practices on greens tend to increase the velocity of ball roll. If cultivation, particularly where a core is removed, is practiced in late fall the results can be serious damage to the greens due to winter desiccation. A third potentially serious problem associated with cultivation is that it can provide openings of bare soil,

"... cultivation is best practiced during periods of active turfgrass growth."

which are ideal avenues for the invasion of turfgrass weeds, particularly annual bluegrass. Because of this problem, cultivation practices should be done with germination and encroachment of potentially serious weeds are minimal.

When to cultivate

Turfgrass cultivation is one of many cultural practices which can be incorporated in a turfgrass maintenance program. It should not be used as a routine cultural Continued on page 84

TALK TO THESE BUCKNER DEALERS ABOUT THE CP-2

Alabama: MOBILE—McGowin-Lyons Hardware & Supply Co. (205) 432-8721. Arizo na: PhOENIX—Turf Irrigation and Water Works Supply (602) 276-2451. TUCSON —Keenan Pipe and Supply Co. (606) 792-3000. Arkanasa: LITTLE ROCK—Capital Equipment Co. (501) 372-7115. California: BAKERSFIELD—Kern Turf Supply Inc. (805) 327-4048. FRESNO—Controlled Irri-gation (209) 222-4843. LOS ANGELES— American Sprinkler & Supply (213) 223-2424. SACRAMENTO—Ewing Irrigation Products (916) 922-5618. SAN LEANDRO —Ewing Irrigation Products (415) 357-9530. SANTA MARIA—B & Supply Co. (805) 925-1828. Colorado: DENVER—The Warner Co. Inc. (303) 355-7371. GRAND JUNCTION—Colorado Western Distribut-ing Co. (303) 242-0556. Connecticut: W. HARTFORD—Hartford Equipment Co. (203) 527-1142. Delaware: CHERRY HILL, N.J.—Lewis W. Barton Co. (609) 429-6500. Florida: FORT LAUDERDALE—Pe-ninsular Supply Co. (305) 524-3611. HA-VANA—Russell Daniel Irrigation Co. (305) 539-6136. PERRINE—Russell Daniel Irri-gation Co. (302) 233-1143. TAMPA— Southern Mill Creek Products (813) 626-2111. Georgia: ATHENS—Russell Daniel Irrigation Co. (404) 543-0168. Illinois: ADDISON—Sprinkler Irrigation Supply (312) 629-7730. Indiana: ADDISON, III.— Sprinkler Irrigation Supply (312) 629-7730. Kentucky: LOUISVILLE—Irrigation Supply Company (502) 585-4305. Louisiana: NEW ORLEANS—Southern Specialty Sales Co. (504) 486-6101. Maryland: RICHMOND —Lewis W. Barton Co. (703) 288-2962. Massachusetts: WEST NEWTON—The Clapper Co. (617) 244-7900. Michigan: ROYAL OAK—Sprinkler Irrigation Supply (313) 548-7272. Minnesota: MINNEAPO-LIS—Milsco Eng. Inc. (612) 724-3855. Missouri: KANSAS CITY—U.S. Supply Co. (816) 842-9720. ST. LOUIS— Bechman Dist. Co. (314) 993-4490. Mebraska: OMA-HA—Big Bear Equipment Co. (402) 393-2200. Nevada: NORTH LAS VEGAS—Las Vegas Fertilizer CO. Inc. (702) 649-1551. RENO—Ariligon Nursery (702) 323-4463. New Jersey: CHERRY HILL.—Lewis W. Barton Co. (609) 429-6500. UNION—Hai-co. (609) 429-6500. UNION—Hai-Souther & AlbUQUERQUE—Albuquerque Chemical Co. (505) 247-2331. New Y 682-6132.



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.



GOLFDOM concludes its rundown on the most frequently asked questions about automatic irrigation

Automatic Irrigation: Ask the Experts

By the EDITORS and FRED V. GRAU

Again, some questions have been carried over from the March issue. These questions have been answered by different manufacturers. Other questions are new. The responses are solely the opinions of the individual manufacturers.

Question: Are present mains usually adequate or must all new lines be installed?

Answer: In some cases a portion of the existing mains can be used; more often they cannot because of location, size or the condition of the piping.

The scaled drawing of the course and site information developed by the designer should indicate the location, size and type of material of the existing piping. Professional design of an irrigation system requires fluency in planning the configuration of piping. There are many alternative routings of pipe for each course, which will bring water to each sprinkler head in the proper quantity at the correct pressure. A professional turf irrigation engineer or golf course architect who designs such systems can best determine the advisability of a layout encompassing some of the existing piping.

Often pipe installed for one system is found to be the wrong size for the new system. Pipe, for example, installed for a manual fairway system is often too large for the new automatic system. Because of the ability to control heads on several different fairways at one time in an automatic system, fewer heads per fairway are run. Therefore, smaller quantities of water are delivered to a given fairway at one time, through smaller lines.

Before using existing pipe, however, if the pipe is one that is subject to corrosion or tuberculation,



its condition and flow capacity must be determined at the site. The anticipated service life and flow characteristics of existing pipe are important considerations in deciding whether or not it is wise to install all new lines.

(Ethyl Corp.)

Question: To what extent is lightning a hazard in an electrical system?

Answer: As hazards go, lightning outranks toe-stubbing. Chances are, improperly grounded automatic control equipment will go along fine for years. But when that first bolt strikes, watch out! The 150,000 volts or so, of a close hit, may destroy one or more of the controllers even though they are scattered all over a golf course. It may pick on the pump house control equipment or blow out the solenoids on the valves and burn or weaken wire insulation. Or all of these things can happen. But they probably won't. Even so, since the cost is so low, grounding all automatic controllers is worthwhile. Simply attached the ground wire to both controller chassis and to the index timing unit-connect the other end to a buried, fourfoot piece of metal pipe (preferably where the ground will be wet , from sprinkling).

(Skinner Irrigation Company)

Question: What is the big compelling reason for an automatic system over a manual system? Answer: Labor saving has to be the most important reason or the

New Tractor Mounted PTO Air Sprayer

Hvers

Myers new A32TM "Mity Mist" is a multi-use air sprayer that is ideal for spraying fairways, greens, trees and shrubs. Its features include: rustproof 100 gallon molded synthetic tank, 32" high-velocity fan, exclusive high pressure Du-All piston spray pump and Drive Mist Nozzles for accurate gallonage application.

Quick-change fairway head (F-50) covers 50 ft. swath or can be removed with ease for tree spraying. Unit can also be used with hose and gun for high pressure spraying, cleaning and flooding.

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New 100ETM Sprayer fits in utility cart beds or mounts on 3-point hitch tractors. 100-gallon polyethylene tank. For boom or gun spray application. Tractor PTO model also available.

A32TM with F50 Air Case

After 100 Years ... More Buyers Still Buy Myers

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Superintendents: Try the Easy Way

A chain hoist on an overhead track is a key item for an efficient golf course maintenance shop

By STAN METSKER Superintendent, Boulder CC, Boulder, Colorado

WITH the right location and equipment, a chain hoist can save much time and energy with routine work, such as sharpening mowers and fixing maintenance machinery.

Locate the overhead track for the hoist far enough inside the shop door so that a truck or tractor can be positioned under it and still be able to get the door closed. Usually the track is crosswise to the entrance. The track should be at least 12 feet and preferably 20 feet long. If there is not enough roof support to be able to hang the hoist from the ceiling, then a self-supported track can be made.

A one-half ton capacity hoist will be enough for most shop work.

It should be at least seven feet above the floor. When hanging from a traveling dolly, the hoist is then ready for lifting and moving heavy engines, mowers, motor cycles and other equipment. It allows the mechanic to easily get the machinery up on a table where it is easier to work on and there is not so much bending over.

This hoist setup is especially helpful when working on tractor clutches or transmissions where the tractor must be split in half to get at the parts. One end can be hung by the hoist and rolled apart allowing access to vital parts.

In routine mower sharpening the mower is washed before it is brought in. The hoist lift it onto a portable work table which has been rolled into place. The mower is disassembled and small parts are further cleaned at a nearby washstand. The hoist is then used to move the mower over to the grinder where it is adjusted to help hold the mower in position while it is being sharpened. All this can be done by only one man and he is in no danger of injuring his back from heavy lifting.

One of the more frequent uses for the hoist is lifting the front or rear end of small turf vehicles. Because of the overhead suspension, there are no jack or blocks to get in the way while working. When the hoist is not in use it can be simply rolled out of the way and takes no floor space.

A one-half ton hoist (\$36) hung from a traveling dolly (\$45) on a four-inch I beam 20 feet long (\$27) is a safe, efficient, low cost system that can save you money in your routine work as well as allowing you to do specialized jobs such as engine, clutch and transmission repairs. Every good maintenance shop should have an organized overhead hoist system.

OVERHEAD HOIST SYSTEM

