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Irrigation system maintenance

Spring start-up, fall shut-down

Much has been written about proper design and installation of an irrigation system. For purposes of this discussion, we will assume that the system is adequate for the course and was installed properly. While there are not any preventative maintenance steps that will really prolong the life of a sprinkler system, there are steps that will insure operation at peak efficiency.

Periodic visual inspection of the entire system is one of the most important steps. If done on a regular and timely basis, it will help to keep repair costs at a minimum. Should a line break, for example, it will be found and can be repaired before costly damage is done to the course itself.

Important, along with this, is a set of drawings of the irrigation system must be available and updated as any and all changes in the system are recorded. Another important factor, again on the installation drawings is a record of controller stations and operation sequences for an automatic system. This can prevent having to go through the entire system to find the valve you're looking for, saving time and water.

It is particularly important to follow a thorough visual inspection program during prolonged wet weather. An area that is not receiving proper irrigation shows up rapidly during hot summer weather. It may be some time before a sticky valve is found when it has been raining for a few weeks.

There are four main areas to inspect: lines; sprinkler heads; and in the case of automatic systems, controllers and wiring.

Broken lines

Broken lines are readily recognizable by a saturated, sunken spot in the turf around the break. There will be a weakened, reduced pattern of coverage by sprinkler heads down the line from the break.

Repairing the break with a compression coupler whenever possible is probably the easiest approach. The coupler may cost a little more, but the time saved in labor more than makes up for it.

A common problem with older galvanized systems is when a head is broken off, the broken piece of pipe is

left in the tee in the ground. Most generally, the pipe is siezed in the threads and is difficult, if not impossible, to remove. The best method of removal is to cut through the wall of the broken piece until you have just cut into the threads of the tee fitting. Then hammer a small chisel between the fitting and the broken piece, forcing the short threaded piece of nipple to collapse. It may then be removed easily. You should avoid damage to the fitting as much as possible, however, a small drip on a lateral line may not be crucial. If you want to be thorough, you will have to replace the tee. This is a much more time consuming job, but will insure a drip-free repair.

Sprinkler heads

There are several problems that can prevent a head from working properly. Plugged nozzles, damage from mowers, excessive growth obscuring the pattern of the sprinkler, head setting below grade, or grit in the head are common problems. If these malfunctions are found in the early stages, by periodic visual inspection and corrected before the turf and other vegetation has been badly damaged, the inspection trips will have been worth it.

If the head is stuck in the up position, it may be the result of sand or gravel clogging the tail-piece of the head. However, the tail-piece may be hanging up on the side of the nipple because of excessive wear or poor construction to begin with. It may only be necessary to clean the head, or it may be necessary to replace the head.

If the pattern of the head is not what it should be, check first for obstruction around the head. It may be that the grass is too long, or that a shrub is blocking part of the pattern. The solution to these problems is simple, mowing the turf to an acceptable height, removing the shrub, or if that is impossible, adding sprinkler heads to cover the area.

The problem could be low pressure resulting from clogged screens, obstructions in the line, low valve adjustments, or just an old wornout pump. If visual inspection of the head and area around it doesn't produce results, be prepared to start checking

the entire system.

If the head sprays a "fogging" pattern, it may be the result of too much pressure in the line. On an automatic system, simply adjust the flow control of the automatic valves. On a manual system, you should check the static and flow pressure and install a pressure reducing valve.

If the head is sitting below grade, the problem is serious, but not irreparable. This situation can be caused by erosion building up around the head, or by a heavy thatch accumulation. It may be only a situation of controlling the thatch. If necessary, however, the head can be raised.

When attempting this repair, it helps if you leave the water on, cutting the flow down until it is barely coming out. This prevents dirt from falling into the line and clogging the next head down the line. Most generally raising or lowering the height of the head is a matter of using a longer or shorter nipple, respectively. Simply remove the head and existing nipple, replace with the long or shorter nipple and replace the head.

Automatic controllers and valves

One of the first things to look for, if a controller is suspected of malfunction is: Is it getting power? You can usually determine this by listening to the clock to see if it is humming. Next thing to check is if power is going out to the valve. This can be done by going to the terminal plate and, using an extra valve (one you're positive works!), touching the common and indicated station wires to see if it activates the solenoid on the extra valve. A voltage tester is a much more valid test.

Finding a break in a wire can be easy, using an automotive engine and an AM radio. First step is to disconnect the suspected controller wire at both ends. Then connect one end of the wire to a spark plug wire, after removing it from the plug. It may be necessary to splice a piece of wire to reach the engine. Then start the engine. Take a portable AM radio, tune it to the lowest end of its scale and turn the volume all the way up. Follow the path of the suspected wire as closely as possible with the radio. The engine will create an interference

in the radio's reception. Follow the path of the wire until the interference stops. This will be the location of the break.

If you're getting power at the clock and power at the valve, it may be a bad solenoid. If the solenoid works and the valve still doesn't, it may be that there is dirt in the valve. Check to see that the bleed mechanism under the solenoid is clear.

If the valve is stuck open and won't close, the problem is usually caused by water not being able to get into the top of the valve. Check the port assembly to make sure it is clear. If water doesn't flow freely, then the system is definitely clogged. It is water in the top of the valve that keeps it closed.

First step is to check between the valve seat and washer to make sure a small stone isn't keeping it from closing. The biggest problem with valves is dirt.

Winter preparation

There are basically six steps to preparing an irrigation system for

winter. First is to shut off the main valve. All manual drain lines should be opened as should all petcocks on anti-siphoning and backflow fittings. You should then manually run through all stations to relieve pressure on automatic valves. If you possibly can, use compressed air to blow the system out. Leave the clock on throughout the winter, but with no station times.

Spring start-up

Before starting the system in spring, make a visual inspection to determine that heads are not damaged or covered up. Take necessary steps to free the head, make any height adjustments that may be necessary, and make sure that the spray head is still properly orientated.

On an automatic system, check for power to the clock and set the stations for proper watering schedule. Run through each station with manual override, checking that all heads are covering their area adequately and are closing properly.

On a manual system, close the

valves and all other fittings that were opened before winter. Close all manual head valves, then open 1/4 turn. Open the main water valve very slowly to avoid damage of water hammer to the system. Open the valve fully only after the sound of flowing water has ceased. Then open each section to make sure coverage is as it should be.

If the system is not functioning as it should, it will be necessary to begin troubleshooting again. Once again, preventative maintenance on an irrigation system, other than perhaps the pumping station, is not like that of a vehicle, where oil can be changed, tune-ups made, etc., to prolong the life of the vehicle. However, by keeping on top of the system, malfunctions can be found and repairs made while it is only a matter of replacing a tee or nipple.

Don't wait until it becomes a matter of repairing the system and replacing a large area of turf. Thorough, timely visual inspections can make all the difference. □

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IRRIGATION DIVISION

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Winter tree survival

Undesirable effects of environment on trees are labeled as a noninfectious disease. Putting aside possible physiological diseases also in this category, such as nutrient deficiencies and excesses, and chemical and mechanical injury, the harshest environmental conditions are imposed by a severe winter.

Low temperature

Trees are rated for their respective winter hardiness by the "Plant Hardiness Zone Map", published by the United States Department of Agriculture, Publication number 814, revised in 1964. This rating can serve as a guide to whether the species you've planted or have to care for in your area are suited to normal climatic conditions in that area. Of course, severe conditions can affect even the hardiest of trees, but if a tree is rated less hardy than the normal for your area, special care must be taken to protect it. This can include making sure they are surrounded by other plants that will protect them, by mulching, or simply that they are in the best possible condition going into winter.

One type of winter injury that can occur to trees well-adapted to the cold is the destruction of new succulent growth caused by a combination of heavy fall fertilization and a late "Indian Summer". This can include dieback of buds, twigs and even small branches. For this reason, late feeding should be avoided.

Winter hardiness can be influenced by the species of the tree, its location, the character of its root system, drainage and the additional effects of bad weather.

Poorly-drained soils are more conducive to freezing than are well-drained soils. Pine, maple and elm roots are among those most susceptible to freezing damage. Freezing is more likely to occur in bare soils when snowcover is limited.

Frost cracks are another injury common to cold weather, but are noticed more often when the sun warms the tree during the day and temperatures drop rapidly at night. They occur most generally on the south and west, or sunny, sides of the trunk.

Frost cracks result from water movement within the trunk. Water moves out of the cells near the outside of the trunk and freezes. This results in drying and shrinkage of the outer

wood. The wood in the center does not experience this shrinkage and sets up a heavy strain which results in the outer bark splitting open, usually with a loud, sharp report. The cracks are often over a foot long, longitudinally, several inches deep and an inch or so wide. Isolated trees, and those in their most vigorous growth stage are most susceptible to this type of damage. It also appears that conifers are more subject to frost cracks than are other evergreens.

The crack usually heals over during the following growing season. It may, however, reopen during the next winter. If this occurs, it may be necessary to screw an appropriate sized threaded rod through a slightly smaller hole drilled horizontally through the crack. It is wise to consult a trained arborist for this kind of treatment.

Young trees can be protected in the fall by wrapping with special paper, burlap, or painted with whitewash.

Dessication

Dessication, or drying, is another harmful occurrence, common to winter. Winter drying occurs because the soil is frozen and water lost by evapotranspiration cannot be replaced. Severe water loss will more often occur during late winter and early spring as weather warms but before the soil thaws. This is most common with exposed evergreens. Screens, if feasible, can help prevent winter drying. There are also anti-transpirants on the market that can be sprayed over the foliage to prevent drying. These melt and disappear as the weather turns warm.

Snow and ice

Snow and ice damage to trees is relative to the amount that occurs. While damage is greater in the North, where temperatures and precipitation is greater, damage is not unknown to the South. The brief ice storm in Atlanta, Georgia during the GCSAA show last year is a good example.

The only real preventative measure for large trees is cabling and bracing. Again, this is best approached by a trained arborist who can insure the right job. If you decide to have a large specimen braced, you might want to consider having it protected from lightning at the same time. Cabling and bracing also protect valuable

trees from strong winds.

Rodents and larger animals

Rabbits and mice can cause severe injury to the trunk of a small tree. Flowering crabapple, Hawthorn, Winged euonymus, and Mountain ash are among the favorite menu items. The trunks can be sprayed with a rodent repellent, or wrapped with a 1/2-inch mesh wire cloth from the soil-line up to about three feet high.

Feeding deer are a danger to tree branches within reach, and can completely demolish small trees. Rutting deer can strip the bark completely from a sapling. Deer repellent sprays are probably the best answer. Fences do not normally keep deer out unless they are high. Recall the article on Elkhorn Valley Golf Course, where Don Cutler had to build an eight-foot fence around his entire course to keep elk out.

Pruning

Pruning should be delayed in the more northern areas until after the period of extremely low temperatures have passed. Cut areas can be damaged by extreme cold. The degree of damage varies with the size of the cut and the strength of the plant.

Winter survival is one of the trials of a tree. Once you have got it safely through the extreme temperatures, snow and ice, then you face summer heat, a host of insects and diseases, more wind and lightning. You can see that insuring winter survival is only one small part of a complete tree care program. It does no good to protect a tree from lightning if you restrict its rootzone by paving, compaction, etc., or allow insects to defoliate it, and the list goes on and on.

There are many excellent books that have been written on the subject. Many of these are available from Harvest Publishing. I would be glad to provide anyone with a list upon written request.

An excellent organization to write for advice on getting professionals to do a job for you is the National Arborist Association, Inc. The address is: 3537 Stratford Road, Wantagh, NY 11793. Robert Felix is the Executive Secretary. Another group is the American Society of Consulting Arborists at 12 Lakeview Avenue, Milltown, NJ 08850. Ron Morris □



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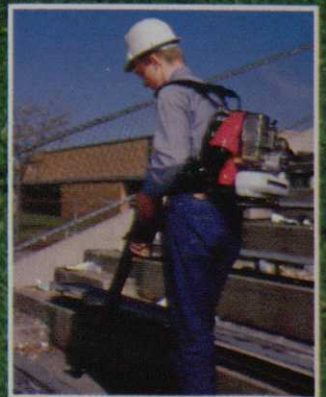
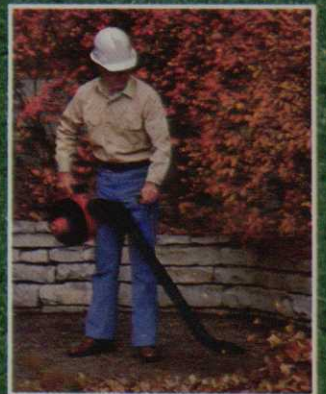
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