# Refresh It—Don't Flush It

*Good water management calls for good equipment properly used.*

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Irrigation on golf courses was unheard of in this country until the turn of the century. At the time, if it was referred to all, it was called watering. The grasses survived as best they could through the stress periods. Needless to say, turf conditions on many greens were on the sparse side by the time summer had passed.

Fred V. Taylor made some studies of golf green construction around that time. He was trying to determine the best way of building a putting green and the best way to maintain it. He noted that watering to keep the seed moist during the first phases of green establishment was very important. At this stage, he was watering the greens frequently, several times a day. After the grass seed germinated and had begun growing, the watering was done only once a day for two hours. This lasted for two to three weeks, then the watering was reduced to two hours every other day for several weeks.

The process of reducing the amount of water continued. After five weeks, the grass was only watered one hour a week. This lasted for several weeks until he felt the grasses were strong enough to do without. After the grasses had matured, they were observed to have root systems of up to 18 inches. Try to remember the last time you observed roots on putting greens that were 18 inches deep. Taylor was very proud of the fact that after several years by summer's end, the greens had a 75 per cent cover. This was considered quite an accomplishment at the time.

One of the most incredible parts of this whole study was that the green he was experimenting on was mowed at a height of 1/8 of an inch. That's extremely close, even today. Can you imagine how fast the greens must have putted with no water and mowed at 1/8 of an inch?

Over the years, watering was increased far beyond the point of Taylor's program. It was called irrigation. At this point we began to introduce new words into the golf course maintenance vocabulary, such as: sprinklers, traveling sprinklers, quick couplers, snap valves, pop-ups, syringing, syringe cycles, and last but not least, overwatering. Once we have reached the overwatering point the matter is academic; the only question is how we are applying the

water. Are hoses and sprinkler still being used, or is the approach more scientific with the use of semi-automatic or automatic systems? It seems that no matter which system is used, the end product is a wet golf course. This condition seems to be practically universal and not peculiar to any type of course whether it has cool season grasses or warm season grasses.

Webster defines irrigate (vb) -gat·ed; -gat·ing 1: wet, moisten: as a: to supply (as land) with water by artificial means b: to flush (a body part) with a stream of liquid (as in removing a foreign body or medicating) 2: to refresh as if by watering vi: to practice irrigation—ir·ri·ga·tion (n)—ir·ri·ga·tor (n).

Irrigation to Mr. Webster apparently means one thing, while to the golf course industry and club members it means quite another. To the golf course industry it means money—irrigation systems and operations are the major expenditure once the course is constructed. To the club member it means green playing surfaces—what makes up the green playing surface is another story. The majority of club members have no idea what grass they are playing on; it could be bluegrass, bermudagrass, bentgrass, *Poa annua,* or any combination. I have seen clubs where they are happy with well manicured weeds. They do not care or mind as long as the color is green and the greens hold.

The superintendent is caught in a different situation. Irrigation systems to him are indeed a friend, because they are labor savers and tools with which he can manage the watering of the golf course. Using this vital management tool, water can be applied at the time it is needed in the amounts required and with a minimum of labor. When used in this manner, irrigation systems are a very worthwhile and necessary investment. The only problem with this type of program is in determining how much water is needed.

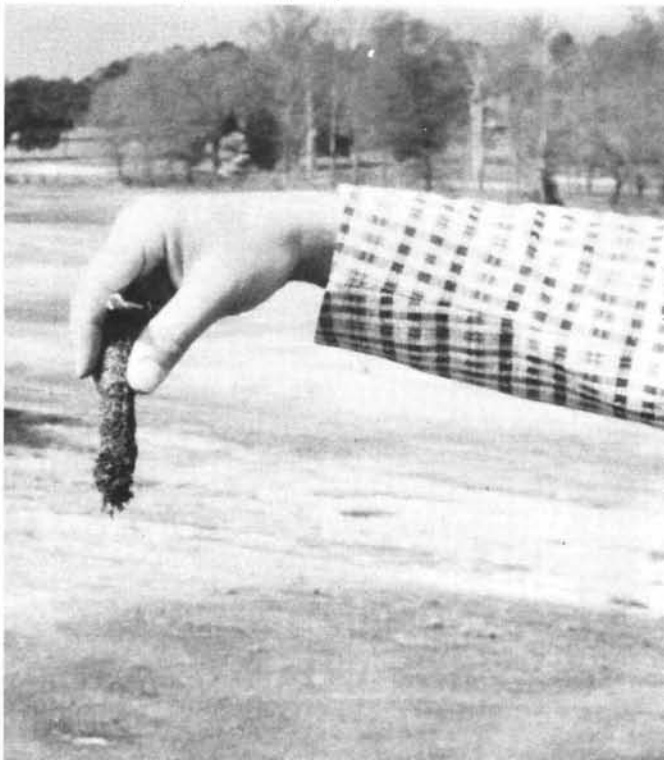
Too many times, Mr. Webster's definitions get confused. Remember, he made a distinction between irrigation of the land and the body. For land, the definition was watering by artificial means and to refresh as if by watering. For a body part, it was to flush with a stream of liquid (as in removing a foreign body or medicating). Gentlemen, contrary to popular belief (although I realize many superintendents become married to the golf course during the summer stress periods and pour their hearts and souls into keeping the turf alive on the course), the golf course is not a body part. The grass and soil are not foreign objects that need to be flushed by a stream of liquid to be removed.

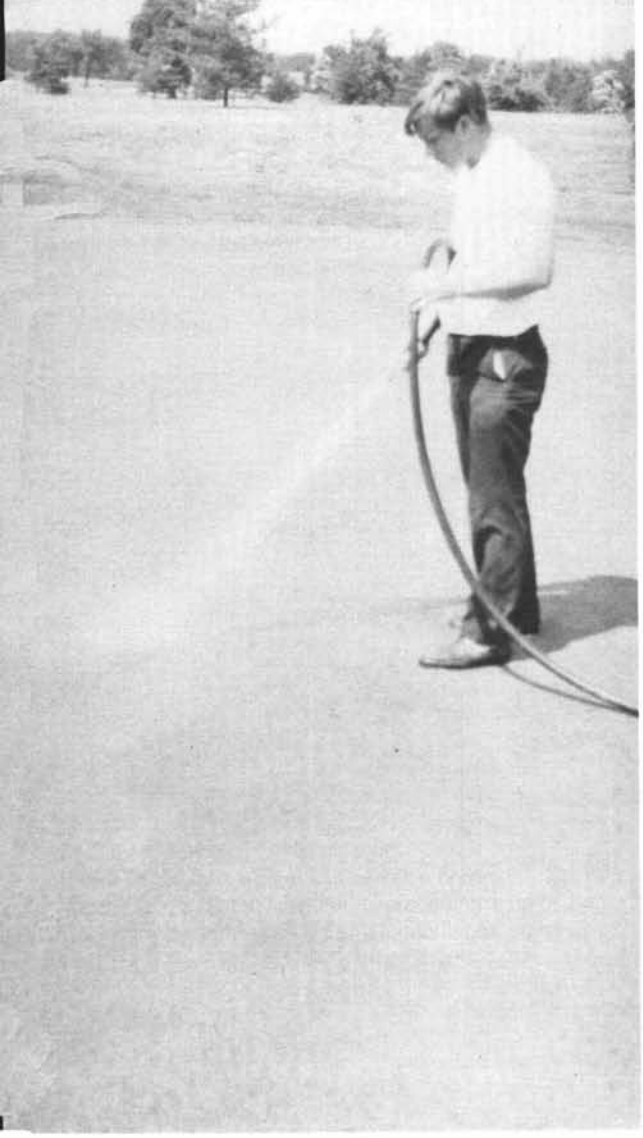
Irrigation can become a foe when not properly managed. Membership pressure as well as non-familiarity with the system can lead the superintendent into poor management practices. Many times, although it is difficult to get anyone to admit it, they do not know how much water is being applied. Sure they know what the system is *designed* to supply, and they know how long the system is programmed to run, but how many know the *actual* amount of water that is being distributed? How many times have cans been randomly placed around the course, on tees, greens and fairways and the actual amount of water applied been measured? I would say relatively few. I would not be at all surprised that if this were done, many people would be amazed that the amount they are applying is greater than what they anticipate.

Probably the best indicator of overwatering, although it is generally noticed too late, is a gradual but significant increase in *Poa annua* population on the course. There have been more areas converted from a high percentage permanent turfgrass surface to a high percentage *Poa annua* playing surface within a few years following the installation of an updated irrigation system that I care to mention. One of the main contributors to this is that the improvements in the irrigation system cost a lot of money. Therefore, pressure is exerted, whether real or imaginary, to run the system frequently to get your money's worth. Another contributing factor is that the new irrigation system is being used, but the old watering practices are also still being used. As soon as either of these situations exist, *Poa annua* percentages begin to increase because the maintenance program has changed in favor of *Poa annua*'s growth.

Overwatering is very seldom by design; it just seems to evolve! The gradual evolution starts when a certain area begins to wilt. This area probably would have not even been noticed ten years ago, because there was not the pressure on the superinten-

*Too much water prevents the roots from penetrating deep into the soil.*





*No! — No!*

dent for wall-to-wall green; and besides, there were probably more important jobs to be done. But now at the slightest sign of wilt, not only is that spot watered, but more than likely, the entire surrounding area is watered. This sort of TLC (Tender Love and Care) starts a process of conditioning the area to demand more water. Because the grasses that were not to the wilting point have been gradually conditioned to expect the watering, the entire area becomes weaker. It is being maintained so that the weakest portion will survive. This type of practice can only lead to an overall weaker turf.

It seems that golfers and turf management personnel have lost sight of the phenomenon of natural selection in nature. Some plants are going to be weaker than others, and they will die; then the stronger plant will take over. According to the imposed laws of the golf world, it seems: "All Will Be Green and Live—Forever." There is no allowance for any turf to die, no matter what. Now, I am not advocating that we do not try to keep the golf course a nice healthy green, but I believe there is a limit.

During the spring and fall when the weather is relatively cool and the grasses show some wilt, I suggest we not be too hasty in applying water. Let the turf come under some stress; force the roots to go down into the soil profile and search for water. The only way they are going to go down is if they are forced to do so. If abundant water is available in the top two or three inches of the soil profile, then that is where the roots will remain. Only when the moisture supply is deeper than the roots, will the roots extend to it. Sure some of the grass will not make it, but I bet surprisingly little will not survive this treatment. And once the grasses become conditioned to the treatment, they will be a healthier green with a good root system.

Along with the grass being extraordinarily green, the putting green probably will be soft. The golf course industry has been pushed into believing a soft putting green is a good green. Of course, the easiest way to get the green soft so that it will hold a half-skulled 9-iron or even a 4-wood is to water it until the ball sticks. Invariably, when the water is used to soften an area where traffic is going to be concentrated, such as tees, fairways or greens; there is a problem with the turf. The more water applied, the easier it is to compact the soil and when the soil is compacted, soil structure is destroyed. When soil structure is destroyed, the plant cannot grow as well because of reduced soil air space. Tight soils make root growth more difficult. A short root system requires more frequent watering. It is no longer capable of supplying enough nutrients and water to the plant to withstand the stress periods. More water is needed, which causes more compaction and shorter roots, which brings about a need for more water, which subjects the soils to more compaction and shorter roots, etc., etc., etc.

This is truly a vicious cycle and the longer it goes on, the worse conditions get. Not only do the conditions get worse for the grass but weed infestations are encouraged. Crabgrass, *Poa annua*, and all the other variations of turgrass headaches arrive when the permanent turf is weakened. During July and August it is truly difficult to keep the grass alive. The grass plant does not have enough root system to support its demands for survival from heat, moisture, and traffic stresses being placed on it.

A program of judicious watering during the cool months of the year will firm up the soil, which will allow for more natural growth of the grasses. Almost without exception, golf course personnel know how much moisture is required each week at any given time in their area. The information has been compiled by the Bureau of Plant Industry by using an evaporation pan and by personal observation. These bits of information can be of immeasurable assistance in planning an irrigation program. However, unless the superintendent is sure how much water

he is actually applying, the evaporation information is of little use. Some suggestions therefore to help control the use of water on the golf course are:

1. Determine how much water is actually being applied.
2. Make sure the areas being irrigated are receiving the right amount of water.
3. Keep spring and fall irrigation to a minimum.
4. When irrigating, apply enough water to wet the soil through the root zone.
5. Increase the interval between irrigations.
6. Try to avoid daily irrigation.
7. Try to determine if the grasses are serious about turning blue and dying or just thinking they are going to die. They are in a way like athletes. You have heard athletes say they thought they were going to die when placed under great stress. But they were well-conditioned and survived. Grasses may also survive.
8. Remember Mr. Webster's words in making a distinction between body and land. We refesh for land and flush for body. And to this date, there is no lovelier stretch of land on earth than a well conditioned golf course.

Poa annua *encroachment is a good indicator of overwatering; notice light spots are in low areas where water stays longer.*

## *From "The National Greenkeeper" circa 1927*

James Lathan, of the Milwaukee Sewerage Commission, called the following poem to our attention from "The National Greenkeepers."

**The Skipper of the Green by G.A. Farley**

For thirty years I sailed the sea,
And every port was known to me;
I was a member of the band
That finds but restlessness on land.

Like every skipper ever born,
I viewed the landlubber with scorn,
And pitied men who chose to toil,
Bound to the tillage of the soil.

But years have taken toll of man
Since birth on land and sea began,
And so I builded me a home
Upon a cliff, lashed white with foam,

Where I could watch the ships sail by,
And hear the seagulls' 'moaning cry,
And keep my faith in dreaming nights
of Southern palms and Northern Lights.

But neighbors interfered, and now
No longer do I scorn the plow,
And ships sail in and out unseen;
They've made me Chairman of the Green.