

# You Can Grow Better Golf Turf — With Less Frequent Watering

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**T**O THE GRASS plant, soil, air, sunlight, and water are what life is all about. We fertilize the soil to help the plant grow, and we cultivate the soil to allow it to breathe. We provide water to the soil because it is essential to the plant. All of these are basic agronomic necessities that can be carried out in many ways. What I'm going to discuss is irrigating turfgrasses on an irregular basis, and what that can do for growing better turf for golf.

Turfgrasses in varied geographical and climatic situations require a certain amount of water. The USGA, GCSAA, and several key universities are in the process of finding and developing lower water-use grasses. Until these grasses become available, we have no choice but to use what we now have.

When I was in school, I remember a test question that asked us to define the effect of mowing on turfgrass. The professor was looking for a statement saying that mowing is the most critical element of grass culture. Mowing frequency and height, he believed, were the determinants of all the other cultural practices. Since then I've come to believe that mowing is important, but it is not as critical to the durability and playability of golf turf as water, applied deeply and infrequently.

We have all been forced to mow grasses closer and closer to provide fast greens and tighter fairways. In some cases this has been detrimental to the general health of the turf. After mowing bentgrass for many years at an eighth of an inch, I am convinced that overall health and the proportion of turfgrass roots to the height of cut can be influenced quite positively with deep, infrequent irrigation. By irrigating in this way, we have been able to stimulate bentgrass root growth to a depth of 12 inches; we've seen roots grow through significant layers in the soil profile, and the putting surfaces have been able to withstand extremely close heights of cut all summer long!

"You can grow better golf turf with less frequent water" fits well under the program title "It's a Matter of Opinion."



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I look at infrequent irrigation as a philosophy. There are so many variables and so few absolute rights and wrongs in this business that you really have to believe in something to make it work.

What's a good reason for an irrigation philosophy? Why do you irrigate the way you do? Do we irrigate a certain way because that's the way our system was designed? Do we irrigate because of soil conditions? Do we irrigate because that's the way people we've worked with irrigated, or do we irrigate to replace evapotranspiration? If we do, do we replace it daily, every other day, or weekly? All of these are reasons for irrigation, and a combination is probably more realistic. The primary motive behind the philosophy of deep, infrequent irrigation is to irrigate to grow roots. At Desert Forest Golf Club, in Carefree, Arizona, near Phoenix, when we replace evapotranspiration, we replace three or four days' worth in a manner that saturates 10 to 12 inches of soil, which is what we want to be our root zone. After another three or four days, when 30 to 40 percent of the desired root zone has dried out, we replace evapotranspiration again. At this point it's important to say the soil system has to be able to take three or four days' worth of evapotranspiration, usually

between one-half and one inch of water under our conditions.

Once we've developed a strong root system and a soil profile able to take this amount of water, we can accomplish many things. We can develop strong, firm playing surfaces and turf stands resistant to disease, we can make our job easier through less summer stress and minimal hand watering, and if we're willing to walk the blue line, it's possible to wreak havoc on the establishment and life cycle of the grassy weed *Poa annua*.

Our green committee at Desert Forest has developed a policy for daily golf course maintenance. Fairways are maintained under guidelines derived from the USGA Golf Championship Manual, which reads, "Fairways should be maintained so as to provide a firm, tight turf. Cultivation and irrigation should be carried out in such a way that hard spots, soft spots, and overwatered spots are eliminated, thus assuring a uniformly firm playing surface."

Cultivation and infrequent irrigation go hand in hand. Again it's extremely important that the soil system be able to take the amount of water we want to apply. Once this is accomplished, we can establish a cycle of deep, infrequent irrigation that will develop a root system and turf with strong tillers, rhizomes, and stolons capable of withstanding traffic and play. Turf irrigated like this will be generally firm, because it is irrigated only once every three or four days, and after we develop a good infiltration rate, the first day will probably be the only day when the ground is wet. Most isolated dry spots will be eliminated, because the volume of water we've applied moves laterally as it saturates the root zone and picks up these areas.

**T**URFGRASS disease is not as much of a concern in the arid western part of the country as it is in other regions. Our disease problems occur primarily on the cool-season grasses. With an arid climate and infrequent irrigation, we do not have to apply



fungicides preventively, and we usually require only one or two curative fungicide applications per year.

The best part about infrequent irrigation is that it makes your job easier. Over the past four years I have been involved with two golf courses, one in Denver, and now in Phoenix. Implementing infrequent irrigation has virtually eliminated the need for hand watering at both golf courses. In Care-free, where we have bentgrass putting greens, the crew used to begin hitting hot spots almost daily from March through November. Now, with a little planning, we try to irrigate putting greens on Friday evenings, and we don't have to worry about the bentgrass for the rest of the weekend. We still have to hand water isolated dry spots on the third and fourth days between irrigations, but the time spent dragging hose is substantially less!

*Poa annua!* *Poa annua* does not like infrequent irrigation, especially in July and August. After it goes to seed in the spring, its weakened root system isn't capable of extracting closely held water from the soil system. It prefers more frequent, easily obtainable water. By stretching irrigation intervals, we keep *Poa* in a weakened state all summer, while deep-rooted bentgrass can regain lost ground. If we stretch irrigation intervals even further, and put up with some footprinting and blue bentgrass, *Poa annua* can actually be taken out using irrigation management alone.

All these benefits can be obtained from deep, infrequent irrigation. If you've believed me so far, you're probably thinking this sounds too good to be true. There's a lot more to it, however, and some negative aspects have to

be addressed. Extensive cultivation or soil modification may be required to get the infiltration rate to one-half to one inch of water a night. Low-flying 3-woods will not hold putting greens, which will make a lot of your players unhappy.

You may have to modify the irrigation system to deliver this amount of water, and there will still be isolated areas that require special attention, like hand watering, soil modification, or drainage. Different areas of the country will require different irrigation timing and probably slightly different methods, but the benefits derived from the philosophy of infrequent irrigation will outweigh the problems.

If you believe infrequent irrigation may have a place in your toolbox of grass growing, let me suggest how to start. The best time to change irrigation practices is when you have had or are inheriting some persistent problems. When changing jobs, if the previous superintendent kept a wet golf course or did a lot of hand watering and syringing that interfered with play, the situation is probably the best possible one for you.

Communication while changing irrigation practices is extremely important. Many things will be different, and your golfers will want to know why. Why is the turf allowed to dry out? Why must we aerate so much? Why do the greens not hold all the time?

Start at the beginning. Don't adopt an infrequent irrigation program in August. In the spring when your turf is coming out of winter, whether it's in the desert in February or Minnesota in May, hold off on the frequency of irrigation. Wait to water until it's absolutely

necessary, or even later. Make turfgrass roots seek deep water in the root zone. When it's time for the late spring aerification, make it an intensive aeration; punch a lot of holes. We use  $\frac{5}{8}$ -inch tines on putting greens, and three different aerifiers on fairways, ending up with approximately 60  $\frac{3}{8}$ - and  $\frac{3}{4}$ -inch holes per square foot.

After the surface is open, see how much water it will take. I think you will be surprised. I've had to modify the irrigation systems at the last two golf courses, because the design was not capable of delivering the amount of water (.9 to 1 inch) I wanted to apply. We wired individually controlled sprinkler heads together at one golf course in order to run the same amount of heads with a quarter of the number of stations. In this way, I could generate 90 minutes of run time and apply .9 of an inch of water in one night. Fortunately, the pipe size was adequate to meet the delivery rate. After a thorough soaking, see how long you can go before the next irrigation, then do it again.

In a short time you will probably notice some of the things we talked about begin to happen. The second year will be better and easier than the first, and the third year still better.

I did not originate the philosophy of infrequent irrigation. As a matter of fact, you can read about it in chapter 14, *Turfgrass: Science and Culture*, by Dr. James B. Beard. But with all of the high tech computerized irrigation equipment available today, and the ease with which automatic irrigation systems will do the job for you, I am certain that the philosophy of infrequent irrigation is another one of those forgotten secrets from the past.