



Environmental conservation: one sports turf manager's story

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I never thought I would be writing an article with Environmental Conservation in the title, but as I reflect on how sports field managers do their job that is exactly what we are trying to accomplish. We are all trying to create an environment in which both grass and athlete can have success. When it comes to athletes we all make safety our priority. While making the fields safe, we are usually doing something to the fields to help it thrive in the environment in which it lives. Conservation for a sports field manager could include irrigation practices, pesticides, fertilizers, and cultural practices.

IRRIGATION

Irrigation across the country means many different things. Some are being faced with major water restrictions while others of us irrigate freely without much thought given to water shortages. As I have managed multiple fields and systems in the past years, I like to think that I am getting better at conserving water. For

me it started by understanding some of the technologies that are available and not pulling a plug and feeling the soil every afternoon. Instead I started using two particular technologies in tandem; ET (evapotranspiration) rates and a TDR (time domain reflectometry) soil moisture meter.

Using ET can be accomplished a couple different ways. We have our own weather station next to one of our practice football fields that reports the data to our central irrigation system. This allows us to have weather data very close to the facilities that we are managing. Obviously there is some cost associated, but the water we have saved has more than paid for the weather station. We irrigate with city water, so only watering with the amounts of water necessary can save money in hurry.

The other way to use ET is by using your local weather reports. Many of the common weather websites report ET rates for the day. You should be able to see the ET for the day and set irrigation run times

accordingly. Using ET is only effective if you know your precipitation rates of your irrigation system.

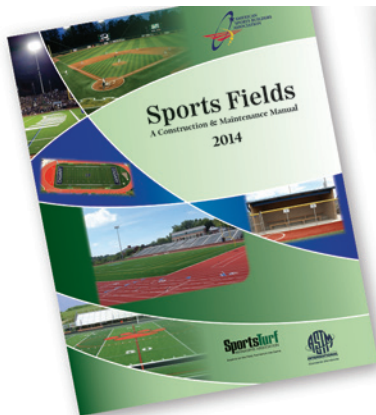
TDR soil moisture probes or TDR soil moisture readers that are placed into the soil permanently are great at giving you an idea of how much moisture is in the soil. Every soil is different, so it takes a little work to understand how to use this effectively to set up irrigation. You will need to figure out what moisture level is Wilting Point and Field Capacity. This doesn't have to be perfect, but getting this close is very helpful. Drying down the field until it wilts and then measuring the moisture level will give you an idea of what Wilting Point is for that soil.

Field capacity is the amount of water the soil holds in its micropore spaces within the soil. This is when the soil is slightly damp and water can be squeezed out of the soil with a little effort. Again you want to be close, not perfect. If you know what field capacity and wilting point for your field are then you can target your irrigation cycles to be somewhere in between those two values. If you irrigate much more than field capacity you could be wasting water going through the soil profile quicker than the plant can use it or its running off the surface in a saturated state. In the real world we probably irrigate slightly above field capacity, but are really just trying to keep the soil at field capacity.

Understanding your precipitation rates for your irrigation

system is very important. I won't be able to give a lot of detail on this in this article for the sake of length, but figuring out how many inches an hour your system irrigates is very important when understanding how to schedule your run times. If you don't know your precipitation rates than you're just guessing with your run times. Guessing could lead to over or under irrigating. Either way it's not an efficient use of water. Auditing your irrigation system isn't terribly difficult if you wanted to do it yourself or there are companies that could do it for you (see *SportsTurf* August 2014 issue, page 30 on how to conduct an irrigation audit). Sometimes spending some money on the front end can save you money on the back end.

If you understand and use ET, TDR probes, and precipitation rates you would absolutely be justified in using the water you do to deliver safe and healthy athletic fields. There are other things like rain sensors and central irrigation that can help make you more efficient as well. The point to all the irrigation tools is to help you conserve water. Remember, you're conversationalists even if you didn't know it. Ask yourself if you do everything you can to conserve water, even if it's readily available. There are times for playability you may abuse water, but that should only be justified for player safety. The rest of the time you should be trying to conserve as much water as possible.



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▲ The outside booms on this sprayer are each their own single zone and are automatically controlled by GPS. This doesn't allow any overlap and closely monitors flow rates and application rates from the operator's seat.

PESTICIDES

The other area where technology has really helped me conserve is pesticide application. Living in the land of corn and soy beans, I was seeing GPS technology being used everywhere. Why not on our fields? was the question we asked. So we built a sprayer (with John Deere's help) that is GPS-equipped. The outside booms are their own single zone and are automatically controlled by the GPS controller. This doesn't allow any overlap which means we never double apply anywhere and can closely monitor flow rates and application rates from the seat of the sprayer.

The other bonus that I didn't expect is that we can now apply at twice the speed we used to and are far more precise. Using this technology shows that we are committed to applying chemicals responsibly and as accurately as possible. It could also lead to pesticide reduction if you have vast areas that you're spraying or struggle with small overlap areas.

GPS technology is not available to all sports turf managers due to costs, but thinking about ways to reduce overlaps and making sure application rates are correct is an important part of being a conversationalists. It is our responsibility to make applications as accurately as possible.

FERTILITY

Another practical area for conservation is fertility. Regular soil tests and plant monitoring is absolutely necessary. Soil tests don't have to be done every year, but they should be done often enough for you to know what's going on with your soil. Fertilizing to specific soil needs is not only going to save you money, but it will also save on nutrient fate in the environment. Each year is different with rain, temps, and field use.

Thinking about all components of what the soil, environment, and field playability will help you justify fertility needs. If you are doing this before fertilizing then you are conserving when you maybe didn't know it.

CULTURAL PRACTICES

Cultural practices are another way we act as conversationalists when we may have not realized. If you are keeping sandy and native soil fields free from compaction and consistent throughout the soil profile you are giving the plants an environment to grow healthy with fewer inputs. If the plants can grow roots and respire more efficiently you will have a healthier grass stand that may need fewer inputs like fertilizers and pesticides. So keep poking holes, pulling cores, and slicing the fields you have. It may save you from disease and other issues that arise when the soil profile is compromised.

Conservation, many of you are already doing it. My hope in writing this article was to share some of the things we do at Iowa State University to help conserve the environment we have. Many of you already conserve, don't be afraid to share those details with your superiors. The general population needs to know that managing natural grass fields is a very specific science and we as sports turf managers take it very seriously. Sharing that we are conversationalists could help change the perception that some people have toward our industry. ■

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▲ Jack Trice Stadium, Iowa State University, Ames, IA.