Photos courtesy of Hunter Industries.

Tips on Maintaining Infill Synthetic Turf

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For the better part of the past 15 years, the sports turf landscape has been swamped with filament style, infilled synthetic fields. Although there is no doubt they are a vast improvement over the original Astroturf, they have still sparked debates of all kinds within the groundskeeping community.

Synthetic fields have gotten better and better over the years with millions of research dollars going into finding ways to make them look and play more like real grass, and dramatically improved construction methods are a far cry from the early days when it seemed like every field was installed by a road builder who thought he could grade for an athletic field.

While there is no doubt that synthetic turf has a place in the industry, no self-respecting groundskeeper wants one as his prized game field. After all, we are in this business to grow grass and to make it lush, green and beautiful, not to groom plastic. Still, we have evolved enough to recognize that having a synthetic field or two for a Division I or professional football team for two-a-day practices, etc., can be a savior for turf managers fighting the daily battle against the damage the ever larger players can do to a field in a short period of time.

In fact, an actual game seems like a walk in the park compared to practice because the number of players on the field at any given time is limited to 22 and the play is, for the most part, spread all over the field, without the dreaded repetition of drill after drill in the same location. The same is true for all the overused high school and community fields with no realistic budget or proper level of manpower to manage them correctly.

Maintenance Free Myth

As turf managers, we have learned a tremendous amount about these infill

synthetic fields over the years and the equipment available to maintain them has grown by leaps and bounds, largely driven by a market need that now makes it profitable to manufacture said equipment.

We have also learned it is a myth to believe these fields do not require any maintenance. In fact they are anything but, and some calculations have shown that factoring in the cost of the initial installation, plus the investment in specific

equipment for their maintenance, and the inevitable replacement of the field 8-10 years down the road, means there may be very little, or even no savings at all over that time.

The issues with these fields are well documented: some have been improved, some are curable, and some simply cannot be cured. Dr. Andy McNitt at Penn State has been conducting a very extensive study for 10 years addressing every conceivable aspect of synthetic surfaces and using natural grass fields as a sort of benchmark for how they stack up, can be changed, improved and maintained to minimize some of the less desirable issues that they pose.

One of the issues that has been shown that cannot really be overcome through any conventional means is that of heat or temperature. Synthetic fields have been measured with infrared thermometers in the south, in the summer, just when most football teams are headed to summer camp, at temperatures of up to 160 degrees Fahrenheit (71° C) on the surface. The bottoms of athletes' shoes have measured as high as 125 degrees (51.5° C). This has caused a shift in the way these fields are used to confine practices to times of the day when the sun it not as intense and the field temperatures are lower. For two-a-day practices, 7 am and 7 pm are the preferred times.

There are some very positive effects to having water available for a synthetic field that were initially overlooked. Consider installing a perimeter irrigation system with your new field.

Some of the early problems that were not anticipated involve compaction of the infill to levels that rival the hardness of Astroturf and cause leg fatigue and concussions; extreme heat on the surface caused by the black rubber infill and underlayment; silica sand dust from the sand infill that has been linked to silicosis; and bacteria that grows on the largely sterile surfaces. The results of these studies have given rise to solutions to some of these problems. Some have proven to be less of an issue than originally thought, but some have shown that they cannot be overcome with any reasonable activity. Altogether however, this is where the no-maintenance theory has been dispelled, and in fact proven that to have a quality synthetic field, it is actually rather maintenance intensive.

The Water Factor

It was originally thought that the application of water to synthetic fields would lower the surface temperature, although no one had provided for a way to do this since it seemed unnecessary at first. People tried various options. Water cannons were brought in to run down the middle of the fields as if growing in a natural grass field. This was not the best solution however, as it typically takes a cannon two hours to travel the length of a football or soccer field. Nevertheless, at first this seemed as though it may be a viable exercise. Initial application of water to a hot synthetic field showed a drop in surface temperature of sometimes 50 degrees or more. This seemed promising, however it was soon discovered that this drop in temperature was very short lived and often lasted no more than 15 minutes. On top of that, it added an element of humidity. This was often right at the level at which the athletes were working, and some reported the humidity made the situation even worse.

Despite the above, there are some very positive effects to having water available for a synthetic field that were initially overlooked. In the summer of 2002, Southern Methodist University in Dallas decided to replace its Bermudagrass game field with a synthetic one to accommodate the football team being able to practice in the stadium every day. As head groundskeeper, I saw an opportunity to take advantage of an irrigation system that was already in place.

We left the system under the field (it was already a 100% sand-based root zone and that was also left intact in the event we would ever want to go back to natural grass) and only removed the heads, capped the swing joints and turned them down in the sand, removed the valves, and altered the plumbing slightly to ensure there would be no water under the field. We then took the perimeter lines and moved them out to the edge of the rubberized warning track and changed the heads from sports field heads to golf course heads so that nearly 100% of the field could be reached with just a perimeter system.

The above strategy was important, and I'm so glad we had the foresight to do it. I knew what was on my field after every practice, game, or for that matter, any event. Think about some of the substances that are deposited on a field during a contest – substances that I would typically wash out with post game irrigation anyway – although the primary importance of that was to begin the healing process for the natural grass as quickly as possible. You have blood, vomit, sweat, spit, potentially other bodily fluids (believe me, I've seen it, even in a packed stadium), and of course the obligatory 10-20 gallons of sugar-filled Gatorade or other sports drink dumped directly on the field by the trainers after every game as they packed up to leave the field.

Some moisture in the field gives the players better footing, and cuts down on the sand and rubber flying that we see on very dry fields.

Now think about all the available living microbes in a natural grass field that would typically render all of this a non-issue. Not so on a sterile synthetic surface, so as soon as the field was clear, the equipment removed, and the bench tarps rolled up, one would go the irrigation to begin the flushing and cleaning process. I believe this to be one of the biggest tools we had available to us in maintaining that field and in keeping what is now an 8-year-old field still looking like one of the best synthetic fields in the country.

There were also other benefits to being able to apply water that we found advantageous. Many groundskeepers with sand-based root zones, particularly with Bermudagrass, have seen that a wet field actually plays better than a dry field, even in a light rain. This is because the root zone is firmer and allows for better footing. As long as there is no soil which gets slippery when wet, this is a proven improvement. The same is true for a synthetic field. Some moisture in the field gives the players better footing, and cuts down on the sand and rubber flying that we see on very dry fields.

This is no small issue to the players who have to deal with these substances in their eyes and noses and can be a bigger problem than is often publicized. Applying water will also cut down on the displacement of the infill, especially at the line of scrimmage where the most aggressive footwork takes place, and it cuts down on static electricity, whether you use a fabric softener or not. This helps with the static attachment of the rubber particles to helmets, but has become an even more significant benefit as more and more players have gone to clear plastic face shields. If you watch closely, you will routinely see these particles attached to all parts of the uniform, but especially the plastic parts like the helmets and shields.

A good soaking of the field during the early morning on game day, or even the night before, will allow you to realize these benefits during the game, and with any required painting complete and the game set up not yet in place, the timing works out perfectly. Only in very hot climates and in the early part of the season, when it is typically warmer everywhere, may the moisture not last for the entire game, but it will last a long time and is always worth the effort.

Lesson Learned

It is important to remember that very little of the above can be accomplished without an in-ground irrigation system just like you would use for a natural grass field. Although it can be done, it is not recommended to place live irrigation lines directly under the playing surface because of the obvious repair nightmares should something go wrong – synthetic grass cannot simply be removed and replaced like natural grass. Because of this, perimeter irrigation is a fantastic tool that very few groundskeepers think about.

You should demand it if you have to make a change, or build a new field, and field designers should recommend it when designing a field. The cost is minimal in the grand scheme of the project and it pays untold dividends that are rarely considered, even if cooling the surface is not one of them. There are ever emerging, new technologies, albeit expensive, that will one day address that issue for sure.

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