WHAT LIES BEN BMO FIELD

MLS Cup 2010. Displays the condition of turf that the system can provide late in the year.

OTS HIGHLIGHT
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Guelph, Ontario.

It's a chilly overcast day in mid March and the Toronto Football Club is playing their home opener at BMO Field. Over 22,000 people are in attendance sitting and watching the game live with even more on TV, yet very few pay any attention to the pitch and the fact it's actively growing and healthy in March. When you look at the grass, you wouldn't suspect what is happening below BMO Field. There are many systems in place to produce a high quality pitch in less than ideal weather conditions. In February I spoke at the Ontario Turfgrass Symposium in Guelph and was asked to recap it for the *Sports Turf Manager* magazine.

BMO Field is about to start its 6th season, its 3rd season with a natural turf field. It was originally constructed with FieldTurf, however after a few years of use it was in rough shape creating a serious need for a better solution. Artificial turf was viewed as a negative by coaches, players and officials. Not only is it not favoured to play on but it also makes scouting difficult in attracting high quality players. In many instances players will not sign with a club that plays on artificial turf. At BMO Field, for a Real Madrid game a few years ago, natural turf had to be brought in and installed over the artificial turf so that the teams would come and play an international friendly. With this strong desire and requirement from professional levels to play on natural turf, the decision to convert from artificial turf was made in the winter of 2009.

BMO Field was constructed as a two acre USGA style green that is planted with 4 different types of Kentucky bluegrass: 35% Impact KBG, 25% Skye KBG, 15% Cheetah KBG, 25% SR 2284 KBG. There

EATH ?

Robert Heggie, Turf Manager, BMO Field

Rubgy SetUp. Displaying the field for its first ever rugby game, Canada vs USA, Summer 2011

are 12 inches of a 95/5 USGA mix above the glycol heating system. The drainage is encased pea stone and is hooked up to the SubAir System.

One of the highlights of BMO Field's construction is the glycol heating system. This system provides the ability to control the temperature of the soil through conductive heat. There are over 42 km of ¾" piping that run 6" apart under the soil that carries the heated glycol to and from the 8 million BTU's of heat generated by the 4 natural gas boilers. The guidelines that we follow for root growth temperatures for Kentucky bluegrass and perennial ryegrass are as follows: <8˚C : Too cool; 8-15˚C Roots become active; 15-22˚C Optimum root temperature; 22-26˚C Risk of Burn; >26˚C Burn

With the ability to control root zone temperature we can break plant dormancy and actually grow turf in early spring or late fall, while weather is less than ideal. When the heater is used in conjunction with a grow cover it creates a 2 acre heated greenhouse. The temperature of the field is monitored by 12 sensors spread throughout the field in a uniform pattern. These Turfguard sensors monitor moisture, salinity and temperature and I can access the information online. The glycol system is wirelessly connected to these sensors and the valves on the heating system open and close depending on their need. Even with the ability to control soil temperature however, the lack of sunlight in the early spring and late fall restricts plant growth. We don't supplement sunlight to BMO Field. Some stadiums that have greenhouse grade lights move them around the field as needed.

The second major feature of BMO Field is the SubAir system. It is basically an oversized, glorified shop-vac that's hooked up to the drainage system. It gives us the ability to remove moisture from the field prior to games and during rainfall, helping to minimize a saturated soil profile and ensure a firm pitch for game play. The system can pull up to 15" of water per hour; the soil profile only drains at 8.7" of water per hour. There is a layer issue which I will explain later, it only drains at 0.9" per hour.

ONE OF THE HIGHLIGHTS OF BMO FIELD'S CONSTRUCTION IS THE GLYCOL HEATING SYSTEM.

There are two sensors in the field for the monitoring of oxygen levels allowing for optimal levels for plant growth. We try to maintain an 18-21.5% moisture level for plant health. The SubAir system applies suction to the drainage lines removing water through the profile so that we don't have to wait for the effects of gravity and percolation. Conversely, the system can be pressurized pushing air through the drainage lines into the soil profile increasing oxygen and gas levels. Pressurizing the system also pushes the heat from the glycol system up through the profile to the surface. The glycol system would not be as efficient as it is without the help of the SubAir system. It can also be used in the summer to lower soil temperatures, pushing a cooler night time air into the soil. The combination of the glycol and SubAir systems gives Toronto one of the most state-of-the-art fields in Canada and even North America.

We keep things basic and don't over complicate anything for pitch maintenance. I am a strong believer in soil, tissue and water tests to determine what nutrients, supplements and soil conditioners need to be focussed on. My granular program is a mix of different NPK fertilizers, K-Mag and a few different micro packages focusing mainly on iron. For a surge of growth and field recovery after heavy use, I focus on soil drenches (ammonium thiosulfate), then harden the plant off with foliar applications of different nutrients like calcium, silicon and potassium. Humic acids are used to drench the soil breaking up bicarbonates and releasing vital nutrients into the soil for plant availability. The majority of my foliar applications are used to enhance the field's colour for games, focusing on magnesium, iron, a little bit of nitrogen and other micro nutrients. I am also a believer in silicon and seaweed products, spraying them before most big events and when I know there will be lots of play. My fertility program might sound a little extensive, but I believe that this is the reason I have NEVER needed to spray any pesticide. A healthy plant combined with the ability to control temperature and moisture levels, helps limit or eliminate insect, disease and weed pressure.

There is a constant need for aeration and topdressing to relieve compaction and level the playing surface. The problem that arises is there are very few times in the team's schedule that provides the opportunity for recovery from an aeration process. Overseeding with perennial ryegrass and Kentucky bluegrass is done

GlycolSystem. The copper pipes on the far left are the outgoing pipes to the field. Those to the right are the return lines. On the right you can see the 4 x 2 million BTU boilers.

on a regular basis to promote juvenility of the pitch. The mix I use is 85% Champion perennial rye and 15% KBG. The seeding rate that I follow is 8-12 lbs/1000ft², and higher rates in heavy traffic areas like the goal mouths, sidelines and training areas.

When the field was planted a little over 2 years ago, there was little notice given to the sod supplier that there was going to be a need for a Kentucky bluegrass grown in a USGA mix. Since there was no way to get a field ready in time, it was planted with a locally harvested sod with a local soil. The field was planted the end of March and there were only 2 weeks to get the field to knit before the first home game. The sod was cut thick to ensure that it would not shift for the first game. As well so there were more roots, which in turn means more carbohydrates, maximizing the odds of a tight field for the first game. Since the sod was cut so thick, it was clear that there was a layer issue that I would have to deal with. To try to beat the layer up, I aerate as often as I can; aerating more than 10 times in two years. Every time I aerate I also top-dress with 35-40 tons of sand. Based on 2" spacing and ½" tine sizes I am only removing a little less than 5% of the field with each aeration process, making the layer issue an almost neverending battle.

ANOTHER INTERESTING MATERIAL WHICH WILL BE USED IN FUTURE APPLICATIONS IS A NYLON FIBRE THAT IS INJECTED INTO THE TOP LAYER OF THE SOIL PROFILE.

The problem with the layer is it hardens off too quickly, minimizing gas exchange and water penetration. The layer creates a reversed water table effect. This isn't just a problem in itself; it also drastically reduces the efficiency of the SubAir system. The long term solution would be to continue aerating and topdressing, or considering a drill and fill program. The quick solution would be either to re-sod the pitch using a sod grown specifically for this application or using a washed sod. In both situations, the layer issue would no longer be present and would create a better growing environment.

Another interesting material which will be used in future applications is a product called StaLok. It is a nylon fibre that is injected into the top layer of the soil profile. The idea behind it is that it creates reinforcement for the root hairs. It is harder to tear nylon than it is to tear a root hair. So if a root hair wraps itself around a tiny piece of nylon it should make it stronger. A good analogy that I often use for the

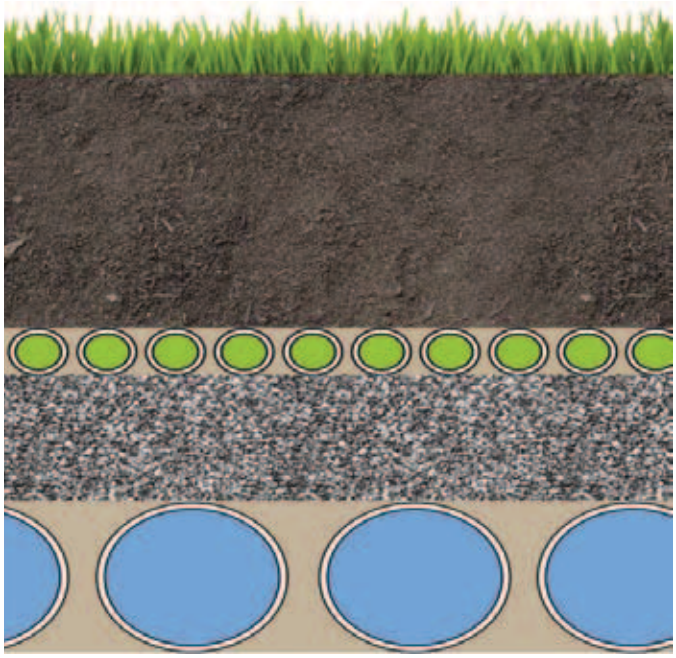
product is, “it’s like a rebar for your soil and turfgrass”. They say that it increases root strength by up to 215% and soil porosity by up to7%.

Field usage is a topic I often get asked about as people sometimes think that my pitch doesn’t get a lot of play. To be honest it sees a higher than average amount of play for a professional level pitch. The field sees about 30 home games (Team Canada Men’s, Woman’s and Toronto FC) with two practices for each game, one or two rugby games plus practices, corporate partner events, and 24-48 hours of community rentals per month. It is also used as the practice field for Toronto FC since they do not have a practice facility as of yet. The time frame in the schedule may not always exist for resodding damaged areas. In my opinion a dead spot is still safer to players and officials than a newly sodded area that could flip up during game play. So if you ever happen to catch a glimpse of a little bare spot on the pitch when you are watching a game, remember that there is more than just the one game being played on the field.

The pressure on BMO Field will be alleviated in the summer of 2012. The Toronto FC Academy practice facility is being built at Downsview Park and will consist of 3 natural turf fields and one artificial, as well as an indoor field house, gyms, and locker rooms. Two of the natural fields will be built with a heated SubAir system, a different method for heating a field. The artificial field will be bubbled in the winter, providing a place for the teams to practice all winter and early spring. This facility is the first of its kind in Canada and will surely be a great step forward for the sport of soccer in the Greater Toronto Area and for the whole country. It is an exciting time for soccer and sports field management in Ontario!

There are many unique systems in place at BMO Field all ensuring a high quality turf at any time of year. It is not inexpensive or easy to grow turf in Canada at certain times of year, but the benefits are well worth it. When you have professional sports teams being televised across Canada and the USA, near field perfection is always a must!

If you have never been to a Toronto FC game, I would highly recommend it. It is unlike any other sports atmosphere in Toronto. Plus I hear they have really nice grass...



Profile. Turf is cut at 3/4”-1”, 12” of 95/5 mix, glycol pipes displayed in green, pea stone layer and drainage displayed in blue.