

volved. For optimum playability, once construction is complete, individuals managing the field must be given the knowledge, equipment and adequate seasonal maintenance budgets for the field.

### Defining Sand-Based

To properly define this infield and the previous ones mentioned, a definition of sand-based or all sand sport fields must be made. The claim to construct a “sand-based” field is often abused and misunderstood. All media used in field construction contains some sand, and in some instances, a selected medium is modified by adding additional sand and referred to as a “sand field.” In these instances, the sand used varies greatly in quality and particle size.

For the purpose of this discussion, a sand-based field is one that contains a

converted to artificial turf at a later date. The sub-base was graded and drainage gravel added to facilitate any future installation of artificial turf. Depth of growing media was 275 mm, allowing for 25 mm of settling, once it was applied to the future surface of the infield. The infield was established to turf by seeding to avoid any “media layering” effect.

Turf established on the future playing surface consisted of a blend of 90% improved Kentucky bluegrass and 10% improved perennial ryegrass. The Kentucky bluegrass component consisted of three separate improved varieties in equal proportions. The original intention was to seed the infield during Fall 2008, with grow-in during the following year (2009).

Due to a delay in constructing the drainage system immediately adjacent to the infield, seeding was delayed beyond Sep-

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**What is a sand-based infield?** For the purpose of this discussion, a sand-based infield is one that contains a minimum of 80% sand, has a specific amount of defined sand particles, a minimum stipulated internal water drainage capacity and a defined range of both micro and macro pores. The media must also be tested in a recognized laboratory.

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minimum of 80% sand, has a specific amount of defined sand particles, a minimum stipulated internal water drainage capacity and a defined range of both micro and macro pores. The media is tested in a recognized laboratory. When a given sample does not meet specifications, amendments are added and the final product is re-tested. Samples for final testing are taken on site when the media is being prepared. In this way, the actual sample being tested will best represent the actual material that will be used. Experience has shown that once a prepared media has been handled (taken from source to field and installed), its internal drainage will in all likelihood be changed. Project specifications therefore stipulate that the media must meet all recommended criteria during its final preparation.

### Field Construction

Following are some of the infield specifications, which also outline the specific provisions followed should the infield be

tember 15 – the day that had been established as the last “safe” date for fall seeding. A decision was made that the infield would only be seeded if a period of up to ten days of temperatures above 12° C were forecast, as it was determined that this would be the minimum amount of time required to get a satisfactory germination of the seed mix.

On September 26, favourable weather was predicted and therefore the infield was seeded. Fortunately this was accompanied by significant rainfall and above average seasonal temperatures prevailed for the next two weeks. A seeding rate of 4.0 lb per 1000 sq ft was used. This was a heavier than anticipated rate but we felt it was warranted considering the possibility of cool temperatures which would limit the germination rate. This proved to be a wise decision as the perennial ryegrass component emerged in seven days followed by the Kentucky bluegrass on day 12. The resulting turf stand was such that it adequately covered the surface, stabilized the



**Top:** Final infield preparations. **Above:** The perimeter of the infield will be completed in 2009 when the running track is installed.

media so that little disturbance occurred and allowed seedlings to grow and develop into strong turfgrass plants. On November 28, by the time the project was closed for the season, Kentucky bluegrass seedlings were approximately 1.25” high and had a sufficient root system to stabilize the media, thus little erosion and displacement should occur over the winter period.

### Other Considerations

During the championships, there will be many television cameras positioned at various locations around the perimeter of the running track, all of which will show a background of turf. To ensure that all turf is of identical colour, turf established in the immediate areas off of the infield will be of the same mixture and receive an identical management program to that of the infield. As a back-up in the case that additional turf may be needed, an area, containing a similar growing medium and turfgrass cover, will be established to turf and maintained exactly to the standards of the infield.



**Above:** All vehicle surface tracks were removed by hand to ensure a proper finished grade on the playing surface.

Once constructed, the contractor has the responsibility of maintaining the infield for the following 12 months. To ensure that the turf matures properly, the contractor will be given a very specific management program to implement. In addition, the selected maintenance staff responsible for the infield during the championships will closely monitor the infield. This will ensure a smooth transition when these individuals take complete responsibility for the infield.

This event requires that the infield and all areas encompassing the site meet the highest possible standards. This is a great challenge with no provision for any “practice.”

## **MEDIA SPECIFICATION** Recommended vs. Actual

<b>Particle Class</b>	<b>% by Volume Recommended</b>	<b>% by Volume Actual</b>
Gravel	<10%	0.0%
Very Coarse Sand	<10%	14.9%
Coarse + Medium Sand	50-75%	57.0%
Fine Sand	<25%	14.0%
Very Fine Sand	<10%	6.4%
Silt + Clay	<15%	7.2%

## **MEDIA** Infiltration, Porosity, Bulk Density, Organic Matter, pH

<b>Characteristics</b>	<b>Recommended</b>	<b>Actual</b>
Water Permeability (in/hr)	5 to 10 in	7.6 in
Total Porosity	35 to 55%	40.4%
Air Filled Porosity	15 to 30%	23.1%
Water Filled Porosity	15 to 30%	17.3%
Bulk Density (g/cubic cm)	— — —	1.58
Organic Matter	1 to 4%	1.81%
pH	6.0 to 7.0	5.50

## **Industry News: Rittenhouse's Unique Alternative to Pesticides**

### **The Green Steam**

St. Catharines, ON – Restrictions on pesticide use are becoming an issue across North America when it comes to maintaining lawns and other weed prone areas. Rittenhouse offers a unique solution.

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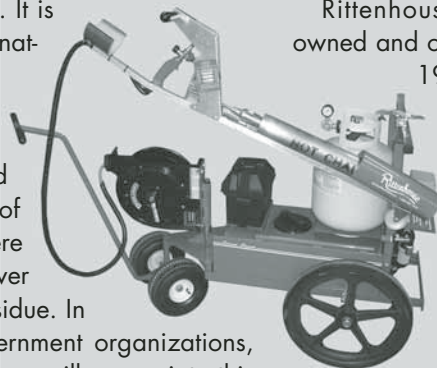
wind for ease of operation. The compact design of the machine also increases usability – at only 60 lb, the Green Steam can be transported easily from site to site. A skid mount version is also available for placement in the back of a truck or utility vehicle.

Cities and municipalities will find the Green Steam to be a very useful tool as part of their regular maintenance programs. It is perfect for eliminating weeds in sidewalks, parking lots and other hardscaped areas. The use of steam means there is no concern over spray drift or residue. In addition to government organizations, private landscapers will appreciate this

convenient alternative to chemical weed control.

The Green Steam provides a unique opportunity to be ahead of the curve and ahead of the competition when it comes to implementing a green care program. Visit [www.rittenhouse.ca](http://www.rittenhouse.ca) or call toll free 1-800-461-1041 to inquire further about the Green Steam and other great landscaping products.

Rittenhouse has been a family owned and operated company since 1914. We have extensive knowledge serving the green care industry as well as other horticultural and agricultural related sectors. Go to [www.rittenhouse.ca](http://www.rittenhouse.ca) to learn more about Rittenhouse and the products we offer.







## SYNTHETIC TURF – A RISING PHENOMENON

FRANÇOIS HÉBERT, LANDSCAPE ARCHITECT, CSLA, OALA, AAPQ, DESIGNER & CONSULTANT, DSSS DESIGN SOLUTIONS FOR SPORTS SURFACES

At the 18th Annual Ontario Turfgrass Symposium, we were treated to a talk on synthetic turf. The speaker, Mark Nicholls, presented the audience with some facts that he feels people need to know about this technology. One thing worth noting about this presentation is that after being present on the market for many years, synthetic turf has finally managed to pop up on the radar of the Canadian sports turf industry. This invariably heralds an upcoming rise in the number of synthetic installations in the very near future.

In one form or another, synthetic turf has been around for a long time. But it is only with the advent of infilled polyethylene turf that this technology started to take serious hold and grow at an increasingly accelerated pace. Invariably, wherever it appeared, synthetic turf was met with strong resistance from many, the most vocal objections being expressed by members of the turfgrass industry. I remember the 2004 STMA Annual Conference when synthetic turf first won

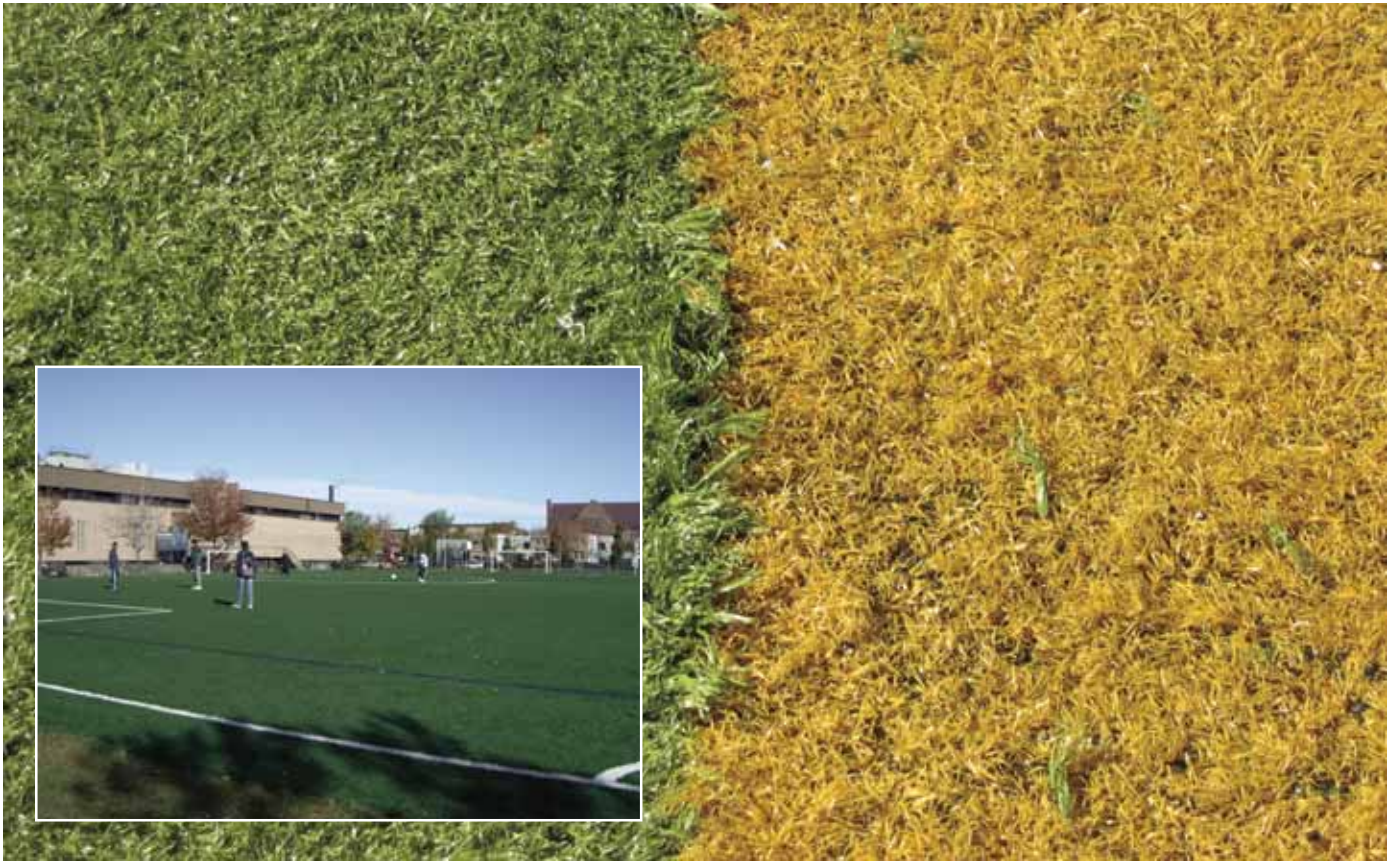
recognition by being the topic of the main session. Mark Nicholls was also one of the speakers at that session. I can still hear some of the speakers in other sessions cutting short their talks to warn the audience of the impending doom of their industry and loss of their livelihood if this menace was allowed to establish itself.

Luckily, in Guelph this year, we were spared such displays and the audience seemed attentive, even if there were some signs of skepticism. But one was able to

**Main Photo:** The definition of the lines in a synthetic turf surface will always be a little low. But in this case, the lines were put in so badly that they cannot be corrected. Poor workmanship is not an option in a product that is meant to last over 10 years.

**Inset:** Synthetic turf can be used in all weather. Here, snow covers this soccer field and the kids can play – even if the snow is still many feet deep around the field. Synthetic fields allow considerable lengthening of the playing season, helping to lighten the load on a municipality's natural turf fields.





tell that the prevailing sentiment was that this phenomenon is something that is here to stay and the audience displayed a healthy appetite for information.

Today, synthetic turf has come to be seen by many not as a substitute to natural grass, but as a necessary tool in the sports field manager's arsenal to provide the public with quality playing surfaces. Faced with an unbridled rise in usage figures and user demands for playing surfaces that are both safe and aesthetic, it is only normal that the claims of the synthetic turf industry attract attention and interest.

### The Downside of Market Growth

Over the last few years, synthetic turf companies have experienced formidable growth. With the generalized acceptance of this technology and growing demand for safe quality surfaces, their business has grown exponentially.

Unfortunately, high market growth and volume have the nasty habit of also attracting some who see this as a chance at making easy money. Sadly, the synthetic turf industry has its lot of less-than-respectable operators peddling cheap products.

As long as the market lies dormant, the efforts of such entrepreneurs are concentrated elsewhere. But when market growth becomes imminent, attention turns towards this new business potential and the market operators become feverish. This is when those entrusted with putting together these projects for their communities are the most vulnerable. The Canadian market is presently at this juncture.

### Pitfalls of Synthetic Turf Projects

When considering a system for his/her municipality, school or sports complex, one of the main dangers looming over today's sports turf manager is to discount the technical nature of this technology and to focus solely on price as a factor to consider. Prices can vary considerably from one installer to another – from roughly \$40 a square metre to over \$60 and well beyond for more elaborate systems. For a 10,000 sq m playing surface, this translates into a price difference that can exceed \$200,000 for what can appear to the uninitiated as similar products. Faced with such a decision, one may naturally opt for the cheaper option, confident that the huge savings will potentially offset whatever

**Main Photo:** Over brushing has totally ripped up these slit film fibres. Thus, they become extremely fragile and their wear resistance is decreased considerably. We see that the yellow line was cut out and glued in place. The joints are coming apart.

**Inset Photo:** Small, accessible playing surfaces can be installed in neighbourhood parks to relieve the user pressure on the bigger natural fields. Informal pickup games are organized on these surfaces and the kids do not feel the need to go onto the regular fields, allowing greater accessibility for maintenance.

slight disadvantages a “cheaper” surface may present.

This is a trap in which all new markets risk falling. Some manufacturers will try to dazzle their customers with the technical aspects of the products, which tends to become confusing. Others will try to downplay technicalities by emphasizing the price gaps between their products and others. They use this gap as a selling point. The novice will inevitably be attracted by this second approach, because it is appealing and it has the advantage of being easy to understand.

## Cheaper is Not Necessarily Better

The history of infilled synthetic turf is strewn with horror stories and failed projects. These can be attributed to many factors such as poor design, cheap products, bad workmanship or even outright fraud and false representation.

Independent of price, when synthetic turf systems are considered, all projects are required to meet certain requirements that are generally considered to be industry standards. For instance, an eight year warranty is one such industry standard, which means that clients will usually expect their surface to be usable for a minimum 10-year period or more. No installer will dispute this. Unfortunately, countless projects have performed poorly and it is not unusual to see some playing surfaces present serious defects after five years of use or less. Some poor installation work can even result in extreme aging of the surface – in some cases, before it is even used!

Consider a 10,000 sq m surface expected to be used for an average of 1,000 hours a season. The initial cost of a \$40/sq m playing surface amounts to \$400,000. At \$60/sq m, the surface costs \$600,000. Over a 10-year period, the hourly usage cost would be respectively \$40 and \$60. But, if the cheaper surface should need to be replaced after only five years because of poor quality or poor workmanship, its relative hourly usage would then be \$80 and the added cost of replacing the surface would also need to be factored in. This would mean that what was initially seen as \$200,000 in savings could end up being \$250,000 in extra costs once the expense of replacing the turf before its time has been added.

This example does not mean that low cost solutions must be shunned. Although some products may be less resistant to wear, they can be appropriate when the anticipated use may be light, such as in some schools or other instances. Other lower cost products can perform just as well as the flashier brands, but are just not promoted as actively by the suppliers. Most companies propose a range of products that address different applications or needs. In cases where lower cost products can meet the needs, it becomes important not to fall for forceful marketing pitches that inevitably favour more expensive solutions.

But on the other hand, it is important to bear in mind that in all cases, quality needs to remain the principal concern in choosing a given product or system. When choosing a system or a supplier, one must always focus on three main aspects: the actual carpet and different components composing the system; the quality of the installation of the system; and the support the supplier and installer will provide throughout the surface's life cycle.

## Striving for Product Quality

Synthetic turf products are typically comprised of three main components: the actual turf fibers, the primary backing into which they are tufted and the secondary backing, which is the coating that is applied to the underside of the carpet to hold the fibers in place. This creates a "carpet" that is but one part of the actual system. When put in place, the carpet is filled in with different materials such as rubber granules and/or sand.

Like anything else, all these components come in varying shapes and sizes, but most importantly, levels of quality. In most cases, an untrained eye could not tell cheap, low grade fibers from the highest quality products. But if visual examination cannot distinguish between qualities, the differences can be dramatic. For instance, extensive research has gone into creating fibers that can resist the devastating effects of UV rays that can break them down in a matter of a few years. They literally turn to dust. Considering the huge amount of fibers that go into a playing

surface, substituting cheap fibers for higher quality ones can be attractive for some suppliers.

The same goes for the other components that go into the system. For instance, the secondary backing coats the underside of the carpet, virtually binding the fibers in place, creating what is called the "turf bind." If this is not done right, or if not enough is used, or the polyurethane is not adequate, the fibers can pull out of the backing causing the turf cover to thin out rapidly. This is especially important with the new monofilament products which typically have lower turf bind. Inadequate undercoating or the use of low grade fibers can result in failing systems. Also, in many cases, the quality control procedures in the production plants (most manufacturers outsource their production – tufting and undercoating) are less than stringent and the delivered products can vary in quality from one job to another, which can result in defects that are not easily detectable.

Fortunately, there are specialized labs that can test the products that are put in place to ensure that: the product that is delivered on site is the one that was agreed upon; the components (fiber, backings, infill materials) are compatible with the specified system, and they perform according to specs (turf bind, fiber density, etc.).

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**Below:** The slightest movements in the stone base are directly translated in unsightly waves in the lines and graphics.





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Even lower priced products can provide great performance if the component and manufacturing quality are there. A low price doesn't necessarily mean a low quality product just as high price doesn't automatically guarantee a high quality product. In every instance, the client must take the necessary measures to ensure that the expected quality levels are met by the supplier. When you install something for a 10 year life span, cheap quality can prove to be expensive.

### **Installation Quality is Also Essential**

Using the best products does not necessarily translate into a well installed system. Installation of an infilled turf surface involves many operations and techniques that can have a devastating effect on the finished project if they are not conducted properly. The use of inappropriate tools and equipment can virtually destroy the fibers before the playing surface is even used. Uneven or insufficient infilling can also cause accelerated surface wear.

Carpet assembly can either be done by gluing the fabric onto a seaming tape with

In order to incorporate the infill material into the surface, the contractor must brush it into the carpet pile, lifting the fibers before laying the infill material between them. Some contractors are not equipped with the proper brushes, either because they do not know better or because they rent their equipment and do not have access to the right equipment. Overbrushing can split and break the fibers, especially the slit film type that is extremely delicate during this operation. This results in a splitting of the fibers which causes them to lose their long-term resistance to wear. Overbrushing can also pull out the fibers when the product has a low turf bind because of faulty design and improper or insufficient coating of low quality fibers.

There are a few ways for project managers to protect themselves from unscrupulous or even incompetent contractors. The first line of defense is to require an extensive list of references with names and contact information so a background check can be made. There are contractors on the market today who have extremely

testing labs to do this for them. Other labs are not registered with this organization, but can apply the standards and conduct the tests.

Such a quality control process should be an intrinsic part of a project and be presented clearly as such in the construction documents. In a new, less informed market, some installers may count on the relative inexperience of prospective clients to try to get away with some corner cutting that can have detrimental effects on the finished projects. With time, information, experience and with the implementation and application of such measures, the more respectable and qualified manufacturers start to gain ground over the cost cutting fly-by-night operators.

### **A Maturing Market Naturally Tends Towards Better Quality Projects**

With the exception of a few specific regions that have experienced very active synthetic turf markets in the past years, the Canadian infilled turf market as a whole is relatively young. Most informed observers agree that Canada is on the verge of a surge in the number of playing surfaces that will be built in the next few years. Industry professionals are feverishly preparing for this anticipated boom.

Typically, the early stages of such a period are characterized by a great number of projects designed around tight if not insufficient budgets that are justified by the general perception that this technology is grossly too expensive. After a while, some playing surfaces start presenting problems that can be attributed to some of the pitfalls that have been described. Then there is a shift towards greater care being given to ensuring better quality both in the products that are used and the installation work that is provided by the suppliers.

The Canadian market is lucky in that forerunners in the users of this technology have made it possible to identify many of the pitfalls that can be encountered in these projects – and some have done so at great personal cost. This acquired experience can now be drawn upon in order to avoid repeating some of the costly mistakes that have been made by others. ♦

— *fhebert@dsssconsultants.com*

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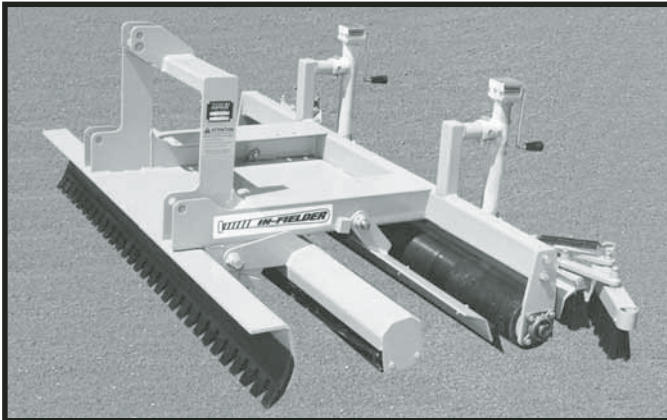
**The Canadian infilled turf market is relatively young.** Most informed observers agree that Canada is on the verge of a surge in the number of playing surfaces that will be built in the next few years.

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special glue, or by stitching the strips together. In Canada, most installers will stitch the seams. But worldwide, more than 80% of turf assembly is done by gluing methods. When the work is well done and proper materials are used, both methods can produce good results. But both methods can also produce disastrous results when they are not done properly. The special glue that is used in this type of assembly is extremely expensive and difficult to manipulate. It can be very tempting for an installer to use a cheap glue because this can mean important savings for him, even if this invariably results in grave problems for the user. Temperature constraints are also very severe, which probably explains why stitching is preferred over gluing in Canada. But improper stitching can also lead to problems, especially if stitching is done on a carpet that was not designed to be sewn.

long lists of finished projects but who have left an incredibly bad track record behind them. The only way to guard oneself against this is to call and ask around. With the number of projects increasing in the near future, people will become more aware of whom the disreputable contractors are and the information will get around. Until then, the onus is on individual clients to inform themselves.

Just as with the products and the different system components, there are specialized firms that can monitor and validate the installation work. Using recognized standards and methods, they can check the work as it is being conducted or just before it is completed so that the client can be assured that the work is done according to specs. Contact information on these firms can be found on the websites of certain international governing bodies, such as FIFA, which certifies



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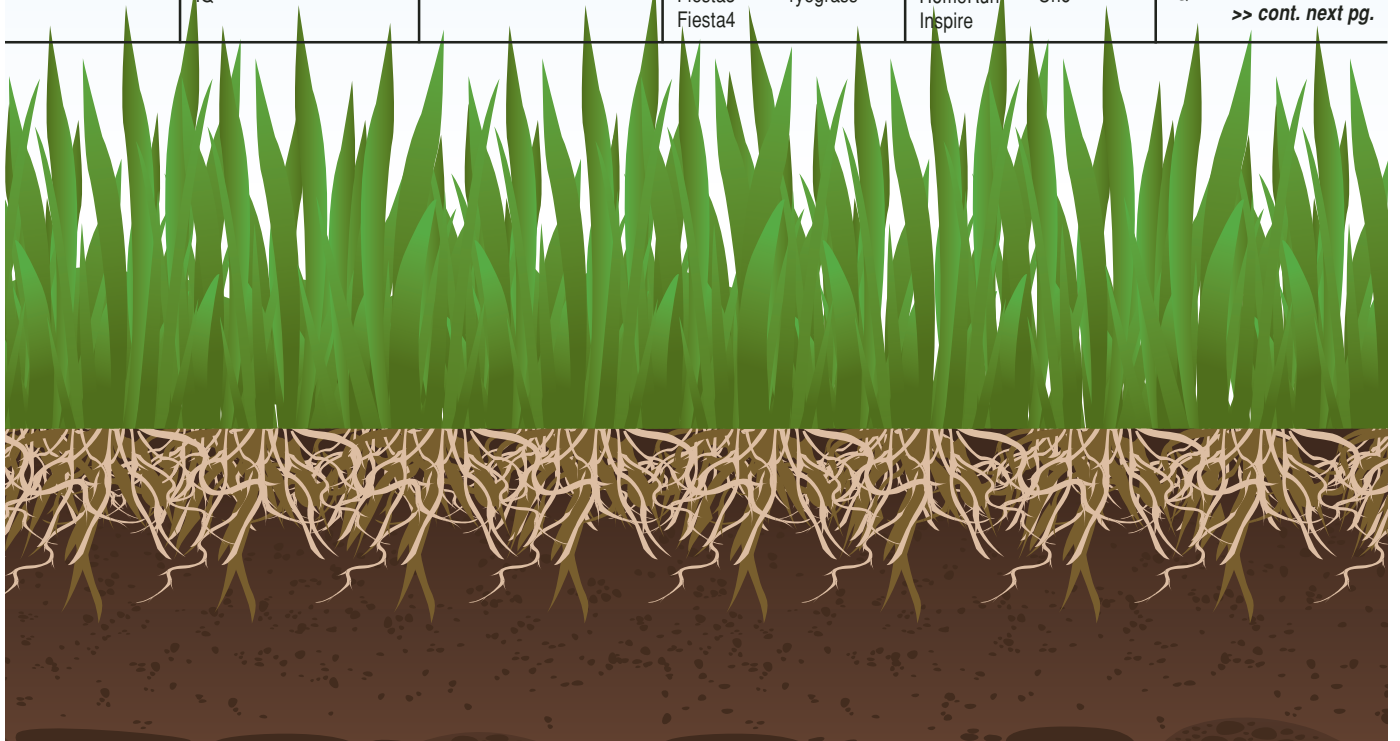
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<b>Kentucky Blue</b>	Amazon Brooklawn Liberator Minnfine Nuglade Shamrock	Award Beyond Chicago II Liberator NuBlue NuDestiny NuGlade	Alpine America Blue Velvet Cannon Crest Explorer Granite Langara Mercury Moon Shadow Quantum Leap Touchdown	Abbey Alene Avalanche Arrow Arrowhead Barrister Blue Sapphire Blueumax Bluestone Cadet Corsair Courtyard Denim Gaelic Juliet	Kelly Midnight Midnight II Midnight Star Moonbeam Moonlight Moonlight SLT Moonstruck Northstar Princeton 105 Prosperity Raven Rugby II Yankee	Amazon Brooklawn Liberator Minnfine Nuglade Shamrock
<b>Texas/Kent. Blue Hybrid</b>			Bandera	Longhorn Solar Green	SPF 30 Thermal Blue	
<b>Poa trivialis</b>	Bariviera	Laser	Darkhorse Racehorse	Sabre II & III Winterplay		Bariviera
<b>Poa supina</b>			Supernova	Supranova		
<b>Poa compressa</b>	Canada Blue	Canada Blue Reubens	Poa Reptans True Putt	Reubens		Canada Blue
<b>Ryegrass</b>	Accent Barclay Citation III Goalkeeper II IQ	Evolution Extreme Top Gun	Blazer 4 Cutter Cutter II Edge II Fiesta3 Fiesta4	Futura 3000 Quebec Transist 2200/ intermediate ryegrass	All*Star 3 Palace Apple GL Presidio Dart Primary Grand Slam II Stellar GL HomeRun Uno Inspire	Accent Barclay Citation III Goalkeeper II IQ

>> cont. next pg.



SPECIES	SUPPLIER											
	Bishop Seeds		Ontario Seed Co.		Pickseed Canada		Quality Seeds		Speare Seeds			
<b>Fescue: Blue</b>					Azay Blue Fescue		MX 86					
<b>Fescue: Creeping Red</b>	Aberdeen Boreal		Aruba Audubon		Boreal Garnet Jasper II Sea Link		Boreal Cardinal Florentine GT Navigator Rose Seabreeze GT Trapeze Wendy Jean		Aberdeen Boreal			
<b>Fescue: Chewings</b>	Ambassador Bridgeport II		J-5 Jamestown II		Silhouette Victory II Windward		Bridgeport II Compass Jamestown IV Longfellow Shadow II		Ambassador Bridgeport II			
<b>Fescue: Hard</b>	Chariot Heron Oxford		Ecostar		Gotham Spartan II		Aurora II Aurora Gold Chariot Heron Rhino Ridu		Chariot Heron Oxford			
<b>Fescue: Sheeps</b>	MX86		Marco Polo		Azay Sheeps		Bighorn Little Bighorn		MX86			
<b>Fescue: Tall</b>	Firecracker Fury Millenium Tomcat		Arid III Inferno		Bladerunner Crossfire II Mustang 3 Team Jr.		Avenger Coyote II Darlington Raptor II Tahoe II Talladega Titanium		Firecracker Fury Millenium Tomcat			
<b>Bentgrass: Creeping</b>	18th Green A-4 Penn A2 Penn G2 Penn T1 Penncross		Penneagle Penneagle II Pennlinks Pennway Providence T-1		Dominant Plus L-93 Penn A-4 Penn G-6 Penn Trio Penncross Coated Penncross		Aggressor Pro Agressor Tournament Cato MacKenzie Mariner Penn A-4 Penn G-1 Penncross Pennlinks II		Independence Memorial Penn A-1 Penn G-2 Penncross Penneagle II Pennlinks II Seaside II Shark		18th Green A-4 Penn A2 Penn G2 Penn T1 Penncross	
<b>Bentgrass: Colonial</b>	Highland		Highland		Exeter SR7150		Glory Highland		Highland			
<b>Bentgrass: Velvet</b>					Greenwich Vesper		Greenwich Legendary					
<b>Weeping alkali</b>	Fults		Fults		Fults Salty		Fults Salty		Fults			
<b>Contact Info</b>	<b>Bishop Seeds</b> 99 John St., P.O. Box 171 Harriston, ON N0G 1Z0 P: 519.338-3840 F: 519-338-2510 info@bishopseeds.ca www.bishopseeds.ca		<b>Ontario Seed Company</b> 330 Phillip St., P.O. Box 7 Waterloo, ON N2J 3Z6 P: 519.886.0557 F: 519.886.0605 dave@oscturf.com www.oscturf.com		<b>Pickseed Canada Inc.</b> 1 Greenfield Rd, P.O. Box 304 Lindsay, ON K9V 4S3 P: 705.878.9240 F: 705.878.9249 dmacmillan@pickseed.com psteven@pickseed.com www.pickseed.com		<b>Quality Seeds</b> 8400 Huntington Road, RR 1 Woodbridge, ON L4L 1A5 P: 905.856.7333 support@qualityseeds.ca www.qualityseeds.ca		<b>Speare Seeds</b> 99 John St., P.O. Box 171 Harriston, ON N0G 1Z0 P: 519.338-3840 F: 519-338-2510 info@speareseeds.ca www.speareseeds.ca			

### TURF SEEDING RATES

The following are seeding rates per 100m<sup>2</sup> for specific species of grass seeds: creeping bentgrass, 0.5-1.0 kg; Kentucky bluegrass, 1.0-2.0 kg; perennial ryegrass, 2.0-4.0 kg; fine fescue, 1.0-3.0 kg; tall fescue, 2.0-3.0 kg; and velvet bentgrass 0.5-0.8 kg

Source: *Turfgrass Management Recommendations*, Publication 384, OMAFRA